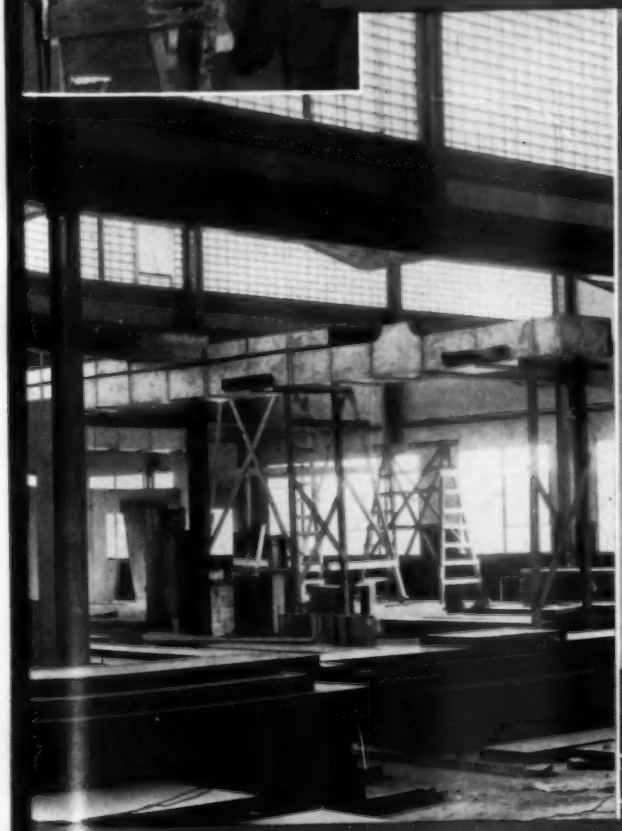
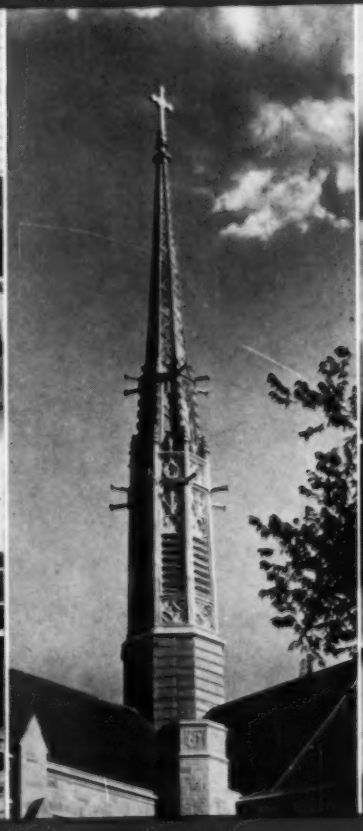
AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING - - SHEET METAL CONTRACTING





APRIL, 1945

Washington Reports on the Heating Equipment Situation - - - - - - Page 46
Konzo—Furnace Selection and Rating - - - - - - - - - - - - - - Page 64
The Coal Conservation Program - - - - - - - - - - - - Pages 63 and 76

WE'RE HOPING OUR NEAR FUTURE IS FILLED WITH PROMISE!

At the moment

we're like a race horse,

rarin' to go,

but without a race track!

We're full of plans for tomorrow . . . when we'll produce even finer Lamneck Products. In the meantime, we're still making vital war needs for the Government.

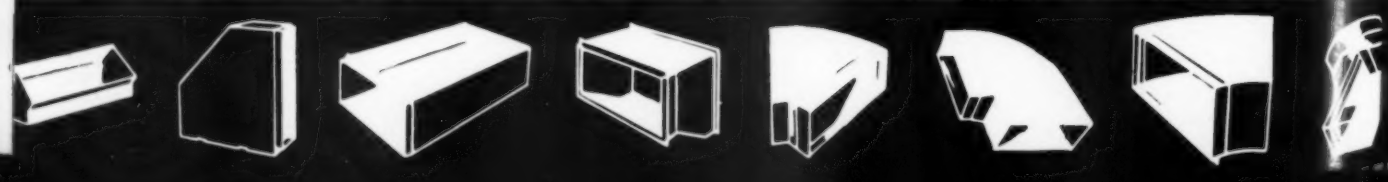
But a great day is coming . . . and before not too long, we sincerely hope. Steel will be back . . . even though in limited quantities. But we'll be able to turn out Lamneck Furnace Pipe and Fittings in sufficient quantity to keep you loyal Lamneck boosters happy.

So keep smiling. Keep your belt tucked in and your hopes high. That two-ocean war isn't won yet. So carry on as best you can and remember that when it comes to quality furnace pipe and fittings, there's none better than Lamneck!

P.S. *For the new Lamneck Illustrated Price Sheet, send us a post card today.*

LAMNECK PRODUCTS, INC., Middletown, O.

LP INC. LAMNECK PRODUCTS



● The products of one of the foremost design staffs in the industry, USAIRCO Coils and Blowers are working with dependability and efficiency on thousands of jobs of war in factories, shops and camps. Their record of USAIRCO Blowers in ships of the Maritime Commission, one of the toughest blower assignments, is outstanding. Simply designed and ruggedly constructed, all the inbuilt worth of USAIRCO products is now ready to serve your most exacting requirements. USAIRCO is in a position to give prompt delivery on essential orders.

UNITED STATES AIR CONDITIONING CORPORATION

SERVING INDUSTRY WITH FINE EQUIPMENT FOR ALL AIR PROCESSING REQUIREMENTS

NORTHWESTERN TERMINAL MINNEAPOLIS 13, MINN.

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES AND SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 114, No. 4 — April, 1945 — Founded 1880

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In This Issue

IT has been impossible, these last few weeks, to make any intelligent sense of the conflicting reports coming out of Washington on reconversion to civilian production.

One morning we read—all controls will be "off" V-E day and production will be unhampered. The next morning we read—controls will continue and reconversion will be painfully slow.

One official says "cut-backs" will be only 10 per cent; another says "cut-backs" will have to be 30 to 40 per cent—or more.

With the idea of determining where our industry stands, the editors spent some days in Washington in March and from interviews pieced together the picture which begins on page 46. It is not an encouraging picture, but readers will please note how frequently and with what emphasis we have prefaced each report with the admonishment — "This picture can change overnight."

The most important fact, in our opinion, is the matter of "Timing," which is explained in this month's editorial on page 45. Though the discouraging picture may change swiftly, the final effect on our industry is whether or not we will get materials in "time" to serve homeowners before next heating season.

The situation calls for careful planning by every one in the industry—the manufacturers, so far as they can—and the dealers who will be faced this summer with scarcities of materials and equipment—and manpower. If we are to do the job which faces us, everyone must plan maximum utilization of every hour, every furnace, every sheet, every effort.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago (2), Ill., U. S. A. Copyright 1945 by Keeney Publishing Company. Publisher—Frank P. Keeney; Manager—Chas. E. Price. Advertising staff: Wallace J. Osborn, New York City, Telephone—Murray Hill 9-8293; J. D. Thomas, Chicago, Telephone—State 6916; Robert A. Jack, Cleveland, Telephone—Yellowstone 1540; R. P. Wettstein, Los Angeles, Telephone—Tucker 2779.

Yearly Subscription Price—U. S. and possessions, Canada, Mexico, South America, Central America, $2.00; Foreign, $4.00. Single copies U. S. and possessions, $.25. Back numbers, $.50. January, 1945, Directory issue, $1.00 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the act of March 3, 1879.

COAL *Gravity* OIL *Forced Air* GAS

MODERN STEEL FURNACES

Rationed? —YOU'RE NOT SHORT OF POINTS WHEN IT COMES TO

SYNCROMATIC

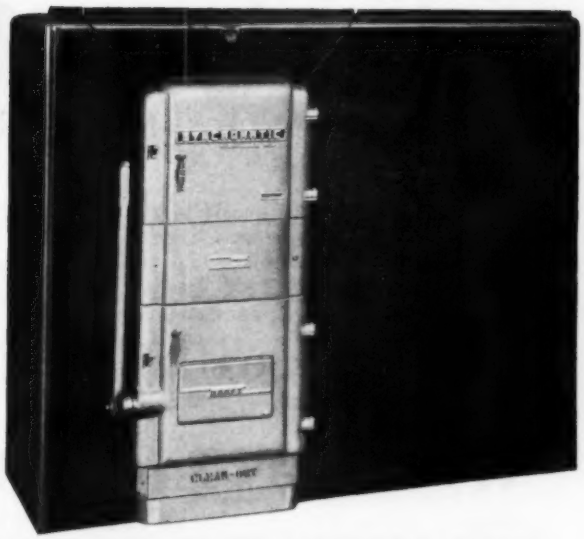
RED POINTS TOO—THAT WILL BRING HOME THE BACON!

1. *Deluxe* BEAUTY FOR MRS. AMERICA.
2. *Mechanical* PERFECTION FOR MR. AMERICA.
3. *Comfort — Safety — Economy* FOR THAT GREAT AMERICAN FAMILY!

SYNCROMATIC HIGH EFFICIENCY HEATING SECTION

THE GRAVITY

THE FORCED AIR



Don't Ration Your Profits!

Write for the address of the Syncromatic Jobber nearest you — We'll tell you all about these Finest of All Steel Furnaces

SYNCROMATIC CORPORATION

5110 NORTH THIRTY-FIFTH ST., MILWAUKEE 9, WISCONSIN

the PLUS Combination that Adds to the roofing business you want in 1945

Wheeling IS the greatest name in roofing, fence and expanded metal.. Its 55-year-old record for quality is PLUS value for You.

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NEW YORK • PHILADELPHIA • CHICAGO • ST. LOUIS • RICHMOND • ATLANTA
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BOSTON • NEW ORLEANS • CLEVELAND • PITTSBURGH • HOUSTON

rationing proves

Gar Wood

EFFICIENCY

IN DETROIT HOMES

The homes illustrated are part of a group selected at random from the many thousands of Detroit residences in which Gar Wood heating systems are installed. The data compiled in connection with the rationing program has revealed their sensational economy.

FUEL CONSUMPTION FAR BELOW AVERAGE

Average prewar Detroit Area Gallons per square foot 1.54

Average Gar Wood Equipped Gallons per square foot .71

These are average figures, not the outstanding performance of one unusual installation. In one of every five homes surveyed the domestic hot water also was heated with oil and this oil is included in the average figure of .71 gallons per sq. ft. of floor area.

The amazing oil economy of Gar Wood units is built in at the factory. It arrives in package form for the dealer to install.

INVESTIGATE THE GAR WOOD FRANCHISE FOR YOUR COMMUNITY

Gar Wood **HEATING DIVISION**

GAR WOOD INDUSTRIES, INC.

DETROIT 11, MICHIGAN

MAKING MONEY *Close to Home*

HUNDREDS of home and factory owners *right near you* are anxious to modernize or repair their property as soon as they can. Now is the time to shape up plans to get a generous share of that local, profitable business.

These people will need roofing, gutters, downspouts, ventilators, air-conditioning ductwork, siding, partitions, machinery hoods and guards, bins and cabinets. It will pay you to get in touch with these people, to find out their individual needs.

And it will pay you to select—from the wide range of U·S·S Steel Sheets—the types best fitted for those jobs. You will find these sheets carefully finished, true to gage, flat, ductile, uniformly dependable in every respect—unsurpassed for workability.

The controlled high quality of U·S·S Steel Sheets is being advertised consistently in many publications read by your customers. So the U·S·S Label is recognized by your customers as the hall mark of quality steel.

Check over the list of steel sheets shown here and note the special qualities of each. For information on the use of these steels, send for your *free* copy of the "U·S·S Sheet Metal Worker's Guide."

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

U·S·S STEELS FOR SUCCESSFUL SHEET METAL WORKMANSHIP

U·S·S GALVANIZED STEEL for sheet metal structures requiring the added protection of a zinc coating.

U·S·S COPPER STEEL to give twice the atmospheric corrosion resistance of regular steel at little additional cost.

U·S·S PAINTBOND—A galvanized, Bonderized sheet that permits immediate painting and holds paint tighter. U·S·S Dul-Kote, a product with properties of equal value, available in the South and West.

U·S·S HOT-ROLLED AND COLD-ROLLED STEEL to provide the basic advantages of steel, plus maximum economy, in accordance with the needs of each individual job.

U·S·S STAINLESS AND HEAT-RESISTING STEELS to assure high resistance to corrosion and heat, and to reduce weight.

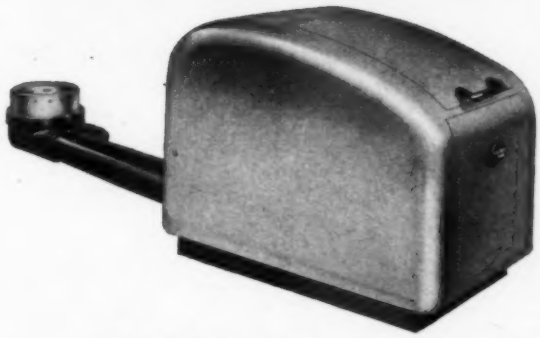
U·S·S VITRENAMEL — Sheets designed especially for porcelain enameling.

U·S·S LOW-ALLOY, HIGH-STRENGTH STEELS to resist corrosion and increase strength-weight ratio.

USS STEEL — UNITED STATES STEEL

UNITED STATES STEEL

A Wise postwar plan



. . . . . a product of three years unbroken *RESEARCH!*

It'll be a "sign" you picked the right line . . . . this CONCO emblem on your window. It'll mean you're selling the newest, most modern, most efficient stoker on the market. Today, write for new literature covering the many outstanding features of the *new* CONCO STOKER — every feature a strong sales point. Yes, CONCO is a name with a *future* for YOU. In that *future,* more and more people will look to CONCO-HEAT for better heat.

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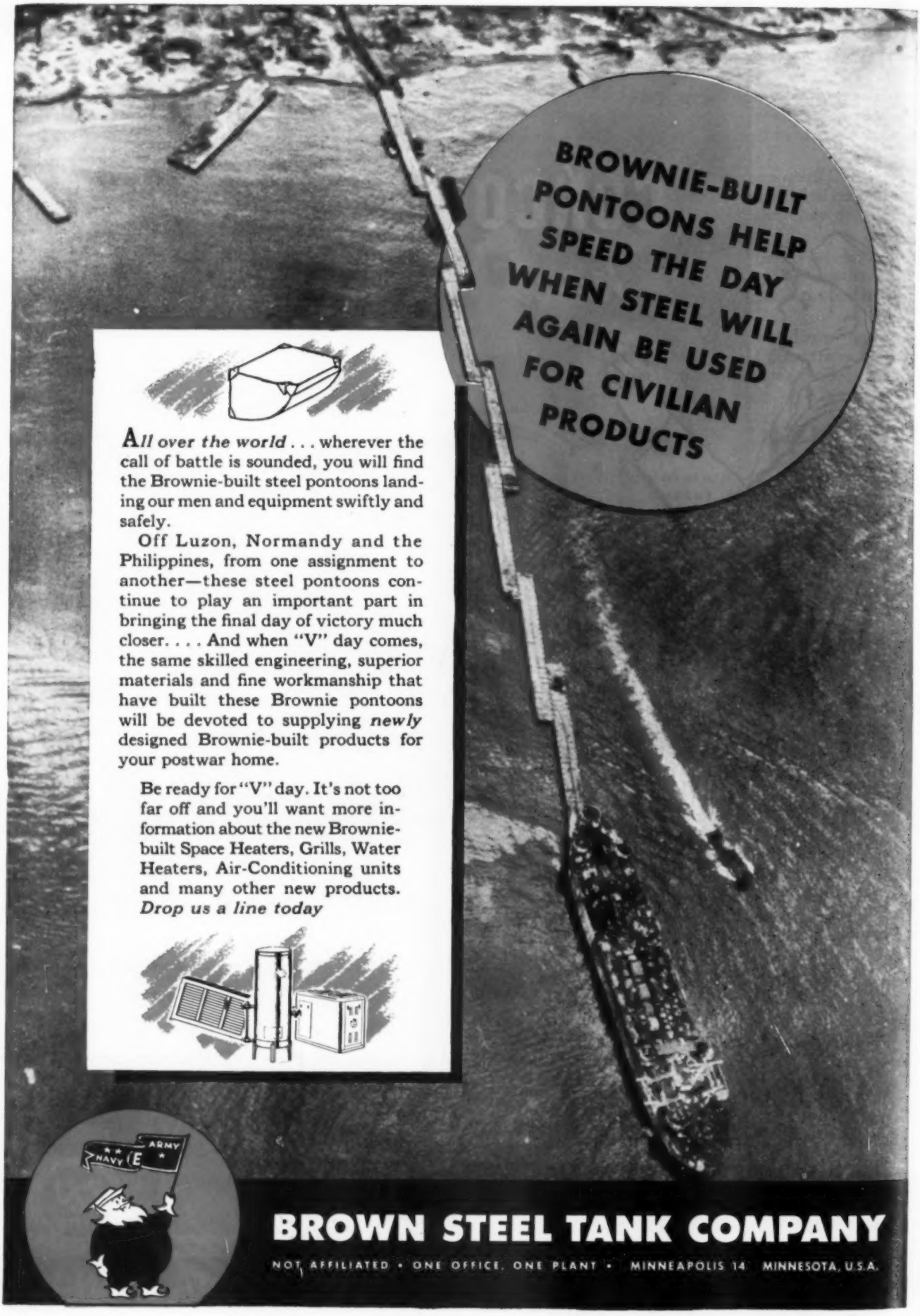
BROWNIE-BUILT PONTOONS HELP SPEED THE DAY WHEN STEEL WILL AGAIN BE USED FOR CIVILIAN PRODUCTS
All over the world . . . wherever the call of battle is sounded, you will find the Brownie-built steel pontoons landing our men and equipment swiftly and safely.
Off Luzon, Normandy and the Philippines, from one assignment to another—these steel pontoons continue to play an important part in bringing the final day of victory much closer. . . . And when "V" day comes, the same skilled engineering, superior materials and fine workmanship that have built these Brownie pontoons will be devoted to supplying newly designed Brownie-built products for your postwar home.
Be ready for "V" day. It's not too far off and you'll want more information about the new Brownie-built Space Heaters, Grills, Water Heaters, Air-Conditioning units and many other new products. Drop us a line today
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BROWN STEEL TANK COMPANY
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NOT AFFECTED BY ★ ATMOSPHERIC PRESSURE...

In the stratosphere or at sea level, in a mile-high airplane or on a tropical isle, White-Rodgers Hydraulic-Action controls *never* need adjustment or recalibration.

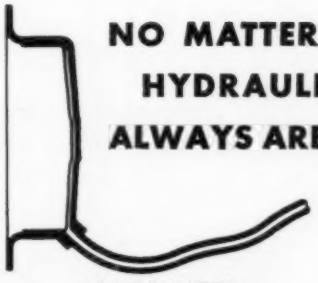
The completely sealed solid-liquid charge of the Hydraulic-Action element is tested before it leaves our plant, and will perform as calibrated no matter where you install it.

HYDRAULIC ACTION CONTROL

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

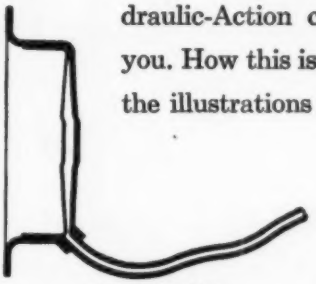
1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
★ 8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.

NO MATTER WHERE YOU PUT THEM HYDRAULIC-ACTION CONTROLS ALWAYS ARE ACCURATELY CALIBRATED



CONTRACTED

Above is a cross section of the diaphragm and part of the liquid-filled capillary. In this view the liquid has contracted, releasing the pressure on the diaphragm and causing the switch contacts to function.



EXPANDED

In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.

Not having to worry about adjustments — fewer service calls — are advantages White-Rodgers Hydraulic-Action controls can give you. How this is done is shown in the illustrations below.

Actual-size illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert full pressure at the point of contact with the switch mechanism.

WHITE-RODGERS ELECTRIC CO.

1215D CASS AVENUE ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air-Conditioning

If you handle sheet metal

Whether you job it or fabricate it, make "doohickies" or duct work, ash cans or aircraft sections . . . .

A *Yoder* Coiled Sheet Line

will cut your costs

because: High quality cold rolled or coated sheet in coils is and will continue to be available at low cost, the stocking of coils is a simple, low cost matter and this fast, versatile Yoder equipment will run out and cut just the sizes you want just when you want them, without waste. Priced within the reach of jobbers, contractors and small shops... LET US TELL YOU MORE ABOUT IT.

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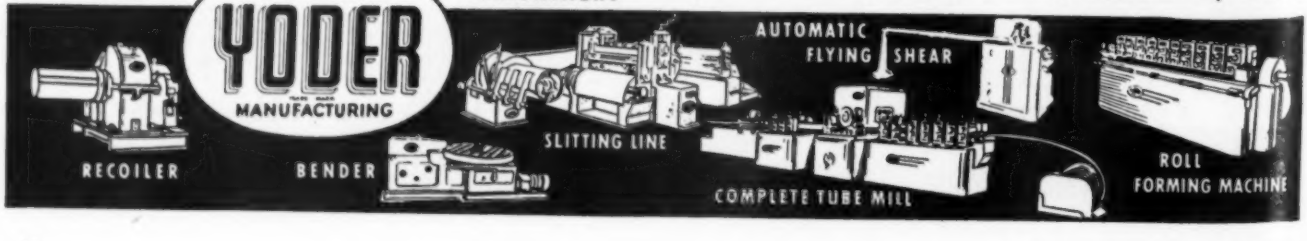


CHECK THE FACTS

AND YOU'LL FIND...

OIL-O-MATIC'S HIGH STANDARDS HAVE WON THE COVETED USAAF "APPROVED QUALITY CONTROL RATING"

When lives depend on the proper functioning of aircraft hydraulic equipment, such equipment must be right when delivered. That's why Williams Oil-O-Matic men and women are elated to have received the coveted U. S. Army Air Forces' "Approved" rating, which says in effect that *the Air Forces place full trust in Oil-O-Matic's own quality inspection procedures and control.*

Oil-O-Matic dealers, too, can be proud of this *official* recognition of the *same high standards* Oil-O-Matic has employed for over 25 years. It provides one more convincing reason why postwar home owners should choose quality-built Oil-O-Matic heating equipment.

ARMY E NAVY

WILLIE O-MATIC says: "If you cash in a War Bond now, you hinder the war effort. Keep supporting our men in uniform by KEEPING the Bonds you buy."

WILLIAMS OIL-O-MATIC HEATING

COPR. 1945, WILLIAMS OIL-O-MATIC HEATING CORP.

WILLIAMS OIL-O-MATIC HEATING CORPORATION · BLOOMINGTON, ILLINOIS

then he said to himself

"Phooey on every good thing"

FEW men are more widely known, and more genuinely detested, than Fuehrer Vidkun Quisling.

. . . and yet few are his orations by which to measure him.

Recently, however, as the Church gained ascendency in Norway, he resorted to a three-word outburst which pictures his double-cross mentality to a T. Says he:

"Religion is outdated."

Well he knows in his stony heart and warped soul that the advance of religion is something that will undo him

. . . so he ridicules it rather than accepts it.

Since when has he ever TRIED religion?

Many men are all too prone to deride that which they do not know *from first-hand expe-rience*

. . . when it is only from first-hand experiences that faith is developed

. . . and that goes for commercial faith as well.

"Outdated!" . . . *he cries*

LOOK, VIDKUN, OUTDATING occurs only when men take recourse to

A BETTER WAY

Such as the arc welding of sheet metal with Lincoln Electrodes:

Cost Cut from 8c to 2¼c with "LIGHTWELD"

THIS sheet metal shop changed over from gas welding to arc welding for 18-ga. table legs and cut cost from 8¢ to 2¼¢ each—a saving of 73%. By changing work in fixture at angle of 60°, welding downhill with 3/32" "Lightweld" Electrode at 120 amps., arc speed is 525 ft. per hr.

Find out how *you* can cut costs and improve products with a Lincoln Arc Welder and Lincoln Electrodes.

LINCOLN ELECTRODES FOR SHEET METAL WELDING

For sheet steel, 18-ga. and thinner:

"LIGHTWELD" (D.C.)
"PLANEWELD 2" (D.C. or A.C.)

For sheet steel, 16-ga. and thicker:

"FLEETWELD 5" (D.C.)
"FLEETWELD 35" (D.C. or A.C.)
"FLEETWELD 37" (D.C. or A.C.)

New "Fleet-Welding" Manual, Bulletin 440, free on request.

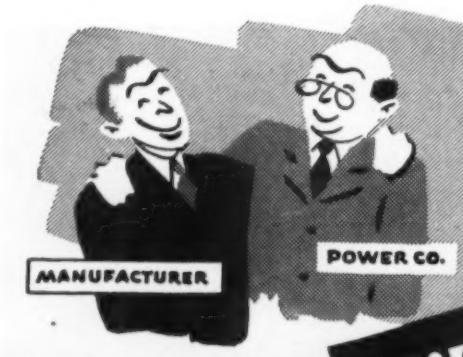
THE LINCOLN ELECTRIC COMPANY • DEPT. L-2 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING

NOW . . . RESISTANCE WELDING AT

Near Unity Power Factor (less KVA)



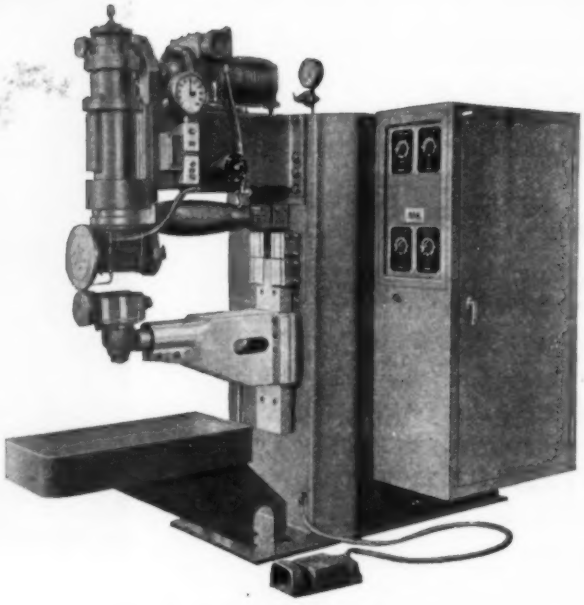
"THREE-PHASE"

Manufacturers and power companies have long been at odds over the problem of supplying power for heavy reactive loads. Particularly in the case of heavy duty resistance welding of steel, power suppliers have often found it necessary to place a ***demand charge*** on the manufacturer.

One reason for this is that conventional welders must utilize the comparatively high frequency alternating current in their secondary circuit. High frequencies mean high reactance, with resultant operation at very low power factor — often 25% or less. Low power factor means more current must be available to meet the same demand . . . often requiring a boost in the size of distribution facilities.

Sciaky "THREE-PHASE" welders are designed to overcome this, as well as other difficulties encountered in heavy duty resistance welding. An ideal low frequency current is produced at the electrode tips by an ingenious system of first, rectifying all three phases of the supply to d.c., then reconverting to an alternating impulse. Operation is on a ***balanced three phase load*** at ***near unity power factor.***

Bulletin 204-A describing fully the Sciaky "THREE-PHASE" principle will be gladly sent on request.



The Sciaky THREE-PHASE principle has been effectively applied to heavy gauge seam welding. The machine illustrated (type PMM.2T-13) welds steel up to two thicknesses of .109" and can achieve a speed of 84" per minute on two thicknesses of .040". Transformer rating is 120 KVA at 50% duty cycle. Unit is entirely self-contained with hinged side mounted rectifier and control cabinets. Electronic controls provide adjustable on-off time, squeeze and hold time.

SCIAKY BROS.

Complete line of AC and DC Electric Resistance Welding Machines

4915 West 67th Street, Chicago 38, Illinois

Offices in Detroit, Los Angeles, Washington, Cleveland and New York

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In England: Sciaky Electric Welding Machines, Ltd., London

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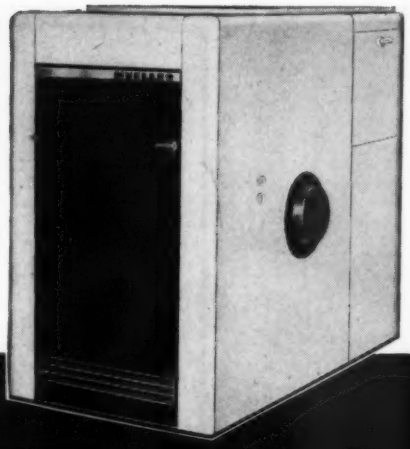


A Mueller Climatrol System to condition the air

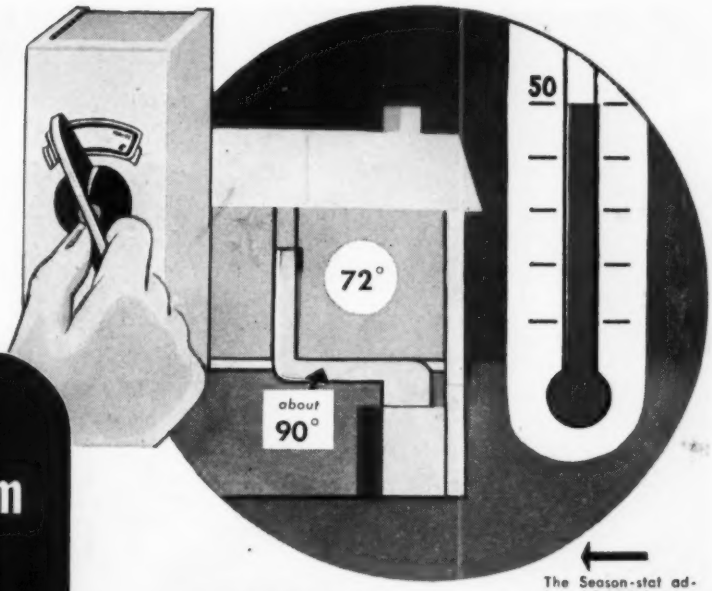
+

...A Mueller Season-stat to keep the system in step with the weather

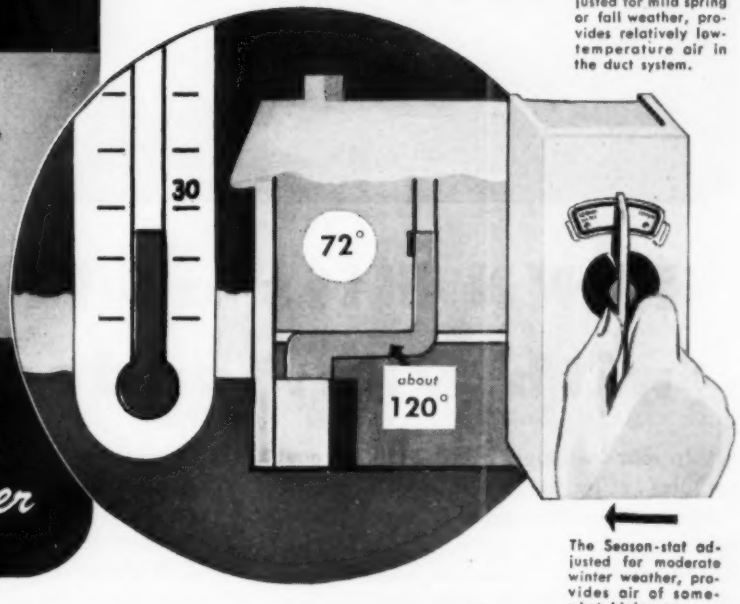
=

True Indoor Comfort

and a satisfied customer

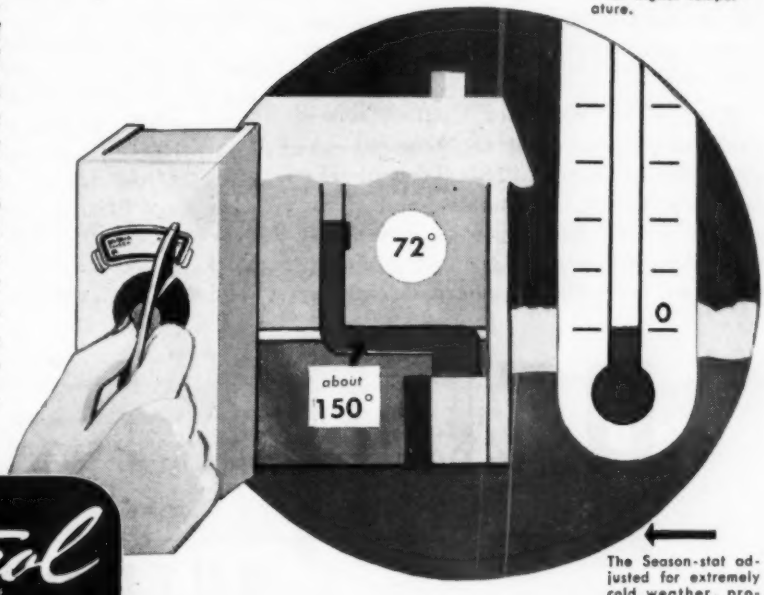


The Season-stat adjusted for mild spring or fall weather, provides relatively low-temperature air in the duct system.



The Season-stat adjusted for moderate winter weather, provides air of somewhat higher temperature.

There are many factors that affect indoor comfort — but they all involve *treatment and handling of air*.... Continuous circulation of air, heated to a temperature in keeping with the outdoor temperature, is attained with the Mueller Season-stat *throughout the heating season.* A simple adjustment does it.... You are on the right track for post-war success when you plan to feature Mueller Climatrol Winter Air Conditioners, equipped with the Season-stat — for gas, oil, or coal. Mueller equipment is nationally-known, nationally-advertised, backed by an 87-year performance record. Write for bulletins. *L. J. Mueller Furnace Co., 2010 West Oklahoma Avenue, Milwaukee 7, Wisconsin.*



The Season-stat adjusted for extremely cold weather, provides relatively high-temperature air in the duct system.

Member

MUELLER Climatrol

Reg. U. S. Pat. Off.

HEATING AND WINTER AIR CONDITIONING

D-48

PENN Hits at Fuel Waste... with Draftender Controls

• Help your customers stretch available coal supplies . . . by selling them Draftender Controls. You'll be right in step with the government's campaign to save critically-needed fuel. And remember, there may be *even greater fuel shortages during next heating season!* Draftender will help your customers get set for it by putting an end to fuel waste.

The PENN Draftender Control sets—available *without consumer priorities*—include damper motor, PENN Temtrol—the heat-anticipating thermostat—and limit switch. These three added to any *hand-fired plant,* assure more economical firing, eliminate the waste of alternate chilling and overheating common with hand-controlled dampers.

Customer satisfaction is assured—as Draftender enables owners of hand-fired heating plants to enjoy thermostatic control usually found only in automatic heating systems.

Today it is not only economical to save fuel—*it is a patriotic duty.* As a result there is a greater need for Draftender Controls than ever. So be sure to order Draftender Control Sets from your local wholesaler now! If you desire further information, write *Penn Electric Switch Co., Goshen Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Powerlite Devices, Ltd., Toronto, Ont.

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

VIKING'S POST WAR PLANNING FILE FOR DEALERS

BLOWER DEALERS GERMANY'S DEFEAT IS YOUR OPPORTUNITY!

NOW — you can cash in on Winter Air Conditioning! You've waited for the moment of Germany's defeat. Now it has come. This is what you've been waiting for. It's reasonable to expect Blowers soon. Go out now and get the business. It's waiting for you. Start by selling Winter Air Conditioning today for delivery in just a short while. Get the orders on your books today.

We can help you get this business. We have a series of three letters that have been tested and proven. Send for them, have them mimeographed and mailed to your prospect and customer list. We have envelope stuffers; send for them and mail them also. We have a four-page illustrated folder explaining Winter Air Conditioning to your customers. It will do 9/10's of your selling job for you. Send for this material now. It's yours for the asking.

Viking

IMPORTANT PRODUCERS OF IMPROVED

VENTILATORS

ATTIC FANS

BLOWERS

HUMIDIFIERS

AIR CONDITIONING CORPORATION • 5600 Walworth Avenue • Cleveland 2, Ohio

So nice to come home to

and a Rudy

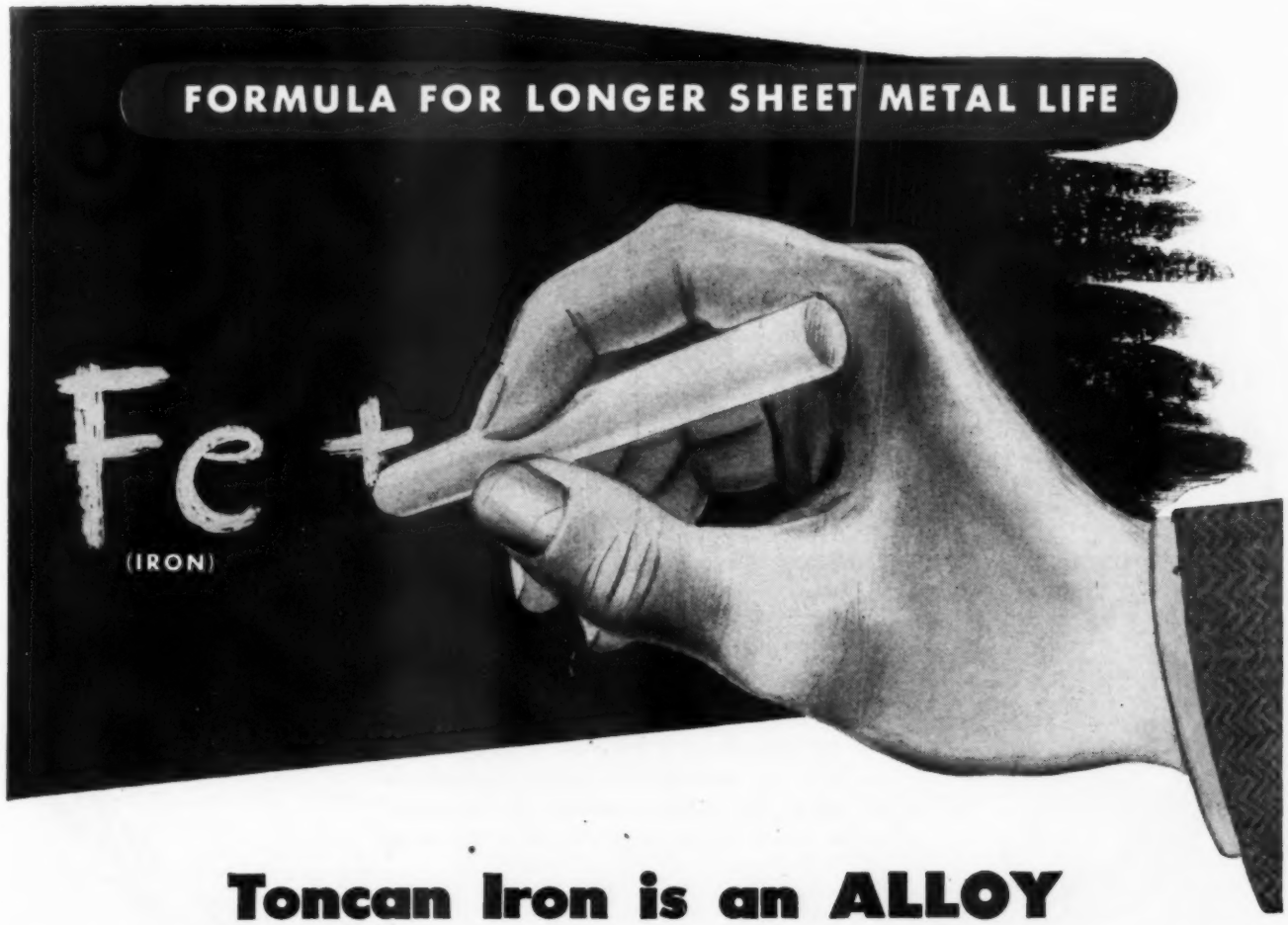
Give a man his pipe and slippers, an easy chair, the evening paper and a loving wife, and you have the traditional picture of COMFORT . . . the commodity you and ourselves are selling. In the final analysis it is COMFORT that home owners buy . . . the kind of clean, healthful, dependable comfort that makes Rudy owners convince Rudy prospects to call in the Rudy dealer.

AVAILABLE NOW!

We can supply a limited number of the new Rudy XM series steel coal gravity furnaces. Sturdy, efficient, dependable . . . welded and riveted with 26 guage galvanized steel castings and hoods. Write for full details.

RUDY FURNACE COMPANY · DOWAGIAC, MICH.

EVEN FINER RUDY PRODUCTS FOR THE WORLD OF TOMORROW



Toncan Iron is an ALLOY

that has the Highest Rust-Resistance of all Ferrous Materials in its Price Class

The outstanding performance of mechanized implements of war has further demonstrated the greater advantages obtainable through the alloying of various metals. That's why Toncan Iron—known for its rust-resistance for some 35 years—should be more popular in the future than ever before.

Toncan Iron is an alloy—with the highest rust-resistance of any ferrous material in its price class. It is made from highly-refined open-hearth iron (Fe) with which copper and molybdenum have been alloyed in correct proportion. It has *twice as much rust-resisting copper* as found in copper-bearing steel —along with *molybdenum* to make the copper more effective.

Toncan Iron is one of the easiest materials to fabricate, too—because it is commercially-pure iron, processed for high ductility. And no matter how you work Toncan Iron, you can't weaken its rust-resistance —for it goes *all through the metal.*

When you need a material to fight rust, you'll find the high-resistance you need, together with easy fabricating qualities, in Toncan Copper-Molybdenum Iron.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Bldg., New York 17, N.Y.

For proof of Toncan Iron's longer service and lower fabricating costs, write for Booklet No. 410, "How Toncan Iron Makes Money For Sheet Metal Contractors and Fabricators."

Republic
REPUBLIC STEEL
PRODUCTION FOR VICTORY
TONCAN COPPER MOLYBDENUM IRON
Reg. U. S. Pat. Off.
—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance.

VISION

Some things can be seen with the naked eye; others require ***vision*** that is based on faith in the future.

Vision has brought Luxaire to a commanding position in the heating industry. ***Vision,*** seeing the need for improvement in living standards, has led to the development of an unsurpassed line of warm air furnaces and air conditioning units.

Vision made possible the doubling of the Luxaire manufacturing facilities in war-time, to help win the fight so that the American way of living can again be resumed and expanded.

Luxaire's ability to foresee, to develop, and to achieve, means that after Victory, Luxaire will be ready for greater leadership than ever in the heating industry, with a line of warm air furnaces and air conditioning units which will help you insure your future in the heating field.

Luxaire

THE C. A. OLSEN MANUFACTURING CO., ELYRIA, OHIO

THE PRE-WAR LINE OF LUXAIRE WARM AIR HEATING AND AIR CONDITIONING UNITS FOR COAL, GAS, OIL

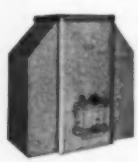
Series 600 Coal Fired Steel Gravity Furnace

Series C Coal Fired Cast Gravity Furnace

Series 700 Coal Fired Steel Gravity Furnace

Series AC-700 Coal Fired Steel Air Conditioning Unit

Series A Gas Fired Steel Air Conditioning Unit



Series G Gas Fired Steel Gravity Unit

Series H Gas Fired Steel Utility Air Conditioning Unit

Series 800 Oil Fired Steel Air Conditioning Unit

PAA PEXTO

. . HELPS KEEP THEM FLYING

At the Pan American World Airways LaGuardia Field Base, New York, the metal shop is operated on a "round the clock" basis. PEXTO is proud to picture the use of its Sheet Metal Working equipment in such important maintenance duties.

Mail being loaded aboard a Boeing Transatlantic Clipper B314.

PEXTO Beading Machines, Slip Roll Formers, Double Seaming machines, Squaring Shears, Bar Folders, etc. are used in the shop to fabricate metal replacement parts, de-icing tanks, water tanks, steam tables, trailing edges of ailerons, elevators, and rudder empenages. Also anything from a hydrostabilizer for a 42-ton Clipper to a water dipper to be used at one of Pan American's overseas bases. The operators who use PEXTO equipment think highly of it . . . as have sheet metal workers throughout the world . . . for 160 years.

Metal Shop, Pan American World Airways base, where 150 people using many PEXTO machines service the fleet of four-motored Boeings.

THE PECK, STOW & WILCOX CO., SOUTHINGTON, CONN., U.S.A.

TOOLS AND MACHINES FOR SHEET METAL FABRICATION . . . SINCE 1785.

PEXTO long-length Squaring Shears, one of many machines used for fabricating Dural, stainless steel and other alloy sheet metals into the many varied replacement parts required for maintenance of Pan American's transatlantic Clippers.

PHOTOS BY PAN-AMERICAN WORLD AIRWAYS

You know that P-K Type "A" Sheet Metal Screws have been boosting profits in progressive sheet metal shops for 30 years. They've been cutting labor and metal assembly time as much as 50%. But Type "A" is only one of the Parker-Kalon "Lucky 7".

You are missing a good bet unless you are acquainted with the rest of P-K's time-saving, money-making family of Self-tapping Screws. There are 7 different types . . . each screw specially designed to do some one specific type of fastening job better, faster, more efficiently – and at lower cost.

Get to know them all . . . now! Write for a copy of the handy, file-size "User's Guide". It shows which type of P-K Screw to use for assembling different kinds and thickness of materials, and how to use it. Tell us what you want to fasten and we'll furnish FREE samples of the correct P-K Screw for the job. Parker-Kalon Corp., 208 Varick St., New York 14, N. Y.

HERE'S ONE OF THE "LUCKY SEVEN" AT WORK Gamsu Ventilation Co., Bronx, N. Y. knows the full P-K line. On this assembly of 16 and 22 gauge galvanized units for a ship ventilating system, the workman is using Type "F". Why? Because *they cut standard machine screw threads as you drive them* . . . thus, if repairs at sea were needed and no P-K Screws were on hand, ordinary machine screws could be used for replacement. Gamsu Ventilation Company says, "We've saved time and money for 25 years by knowing all types of P-K Screws."

PARKER-KALON
Quality-Controlled
SHEET METAL SCREWS

JANITROL Gas-Fired heating equipment gives top-notch performance . . . and keeps it up for years and years of satisfying service. Why? Because Janitrol is designed for long lasting operation.

For example, Janitrol cast iron Multi-Thermex heating tubes are *designed* to take *exactly the right amount* of heat from the burned gases passing through them. Too little heat extraction means waste of fuel. Too much can cause condensation and corrosion on heat transfer surfaces.

Burnouts are eliminated by the unique manner in which the Multi-Thermex tubes fit snugly over the compact Amplifire burners . . no bulky combustion chamber to build up excessive heat at the base of the tubes.

Patented design of Janitrol ribbon type burner assures uniform expansion and contraction along the entire length of each alloy strip forming the Amplifire burner heads. No buckling, no twisting, no breaking loose can occur with this construction.

And these are only a few of the many design developments which make Janitrol your best bet in supplying the postwar heating demands of your customers to their greatest satisfaction. Remember, Janitrol is built to last. No other gas-fired heating equipment has all of Janitrol's engineered advantages! For more information, write Surface Combustion, Toledo 1, Ohio.

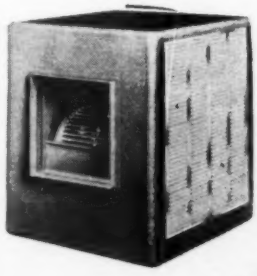
Janitrol GAS-FIRED HEATING EQUIPMENT

THIS SIDE OF CARD FOR ADDRESS
POCAHONTAS FUEL COMPANY INCORPORATED
Stoker Division
340 East 131st Street
Cleveland 8, Ohio
spend that Penny NOW!
● A postal card will bring you full information on the stoker everyone is talking about. POCAHONTAS—the first successful bin-feed, ash-removal bituminous stoker—already thousands in use. Now is the time to investigate!

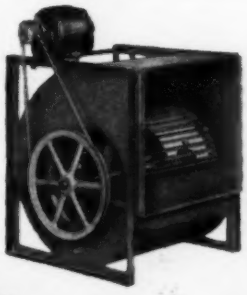
THE PERFECT UNION
of June and December

PROPELLER FANS

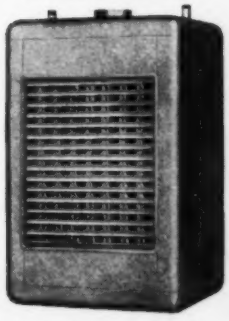
EVAPORATIVE AIR COOLERS



STANDARD BLOWERS

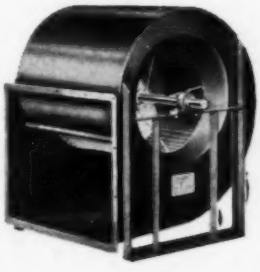


UNIT HEATERS

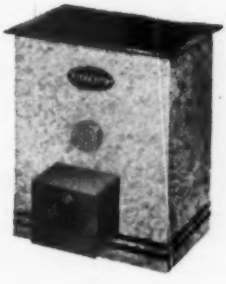


UTILITY

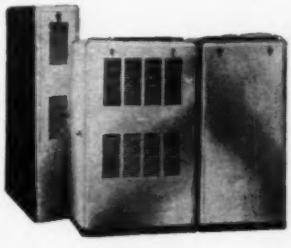
HEAVY DUTY BLOWERS



FLOOR FURNACES



FORCED AIR FURNACES



Fan Type CIRCULATING HEATERS

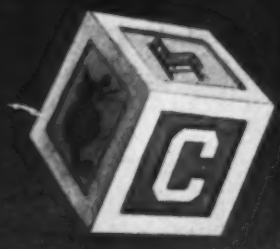
With the complete UTILITY line of air cooling, ventilating and heating equipment, you will have profitable sales all through the year. Let us show you the advantages of handling all these appliances from one dependable source.

UTILITY Appliance Corp.

Formerly Utility Fan Corporation

4851 S. ALAMEDA STREET • LOS ANGELES 11, CALIFORNIA

SIMPLICITY . . .



MOR-SUN
PRESSED STEEL FURNACES

"The Sun Never Sets with MOR-SUN!"

For many years, a well known cartoonist has delighted us with his ridiculous and complicated inventions . . . . usually demonstrating how to do things the hard way.

In the pre-war era, it appeared as though this man was influencing gas and oil furnace design . . . . To achieve a lower stack temperature, designers added more trappings . . . . radiators, baffles, tortuous flue passages - - all conspiring to collect dirt and condensation . . . . or to cause pulsation.

MOR-SUN designers started all over again with fundamentals . . . plain, simple principles . . . . long known to furnace designers . . . . but dropped by the wayside in deference to obsolete production facilities . . . . or to a desire to impress the prospective owner.

Thanks to Morrison's unusual factory equipment . . . . MOR-SUN engineers were able to create a modern PRESSED STEEL furnace . . . . efficient, rugged, attractive . . . . and as simple as A-B-C.

MOR-SUN is worth waiting for!

MORRISON STEEL PRODUCTS, Inc. Buffalo 7, N.Y.

The "BIG 3" in Bearings for Air Handling

Randall

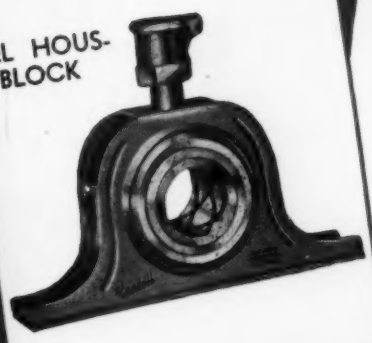
Quiet-running Randall Pillow Blocks have given such smooth, efficient operation to furnace blowers and air conditioning equipment that over 2¼ million have been installed.

There is a Randall Pillow Block for every furnace blower or air handling need. A pillow block that is self-aligning, self-lubricating with or without double reservoir oil return feature and that has proved itself on hundreds of thousands of units in the field.

Quiet

Whatever your bearing needs may be, let our engineers work with you to eliminate every bearing problem. Write now for catalogs 42 and SB42, without obligation.

ONE-PIECE STEEL HOUSING PILLOW BLOCK



STREAMLINER ONE-PIECE STEEL HOUSING PILLOW BLOCK

STANDARD PILLOW BLOCK

Representatives Carrying Stocks

C. W. Marwedel, San Francisco, Cal.
Salt Lake Hardware Co., Salt Lake City, Utah

Tek Bearing Co.
177 Lafayette, New York City
1192 Commonwealth Ave., Boston, Mass.

RANDALL GRAPHITE PRODUCTS CORPORATION
DEPT. 411, 609 W. LAKE ST. CHICAGO 6, ILL.

MILCOR
is just as anxious to make these for you as you are to get them
Right now, shortages of materials and manpower have practically eliminated the production of these products. But Milcor is ready to make them as soon as these restrictions are lifted . . . Ready to again be your reliable source for everything you need in rain-carrying equipment, roof trimmings, and accessories . . . for better-paying jobs, better-looking jobs that give your shop a reputation for quality workmanship. Remember Milcor.
★ ★ ★
Not now — but soon (we hope), you can look to Milcor for:
Conductor Pipe . . . Elbows . . . Cutoffs . . . Funnels . . . Strainers . . . Eaves Trough . . . Mitres . . . Ends . . . Drops . . . Ornamental Bands . . . Hooks . . . Hangers . . . Shanks . . . Circles . . . Roof & Box Gutters . . . Ridge Roll . . . Formed Valley . . . Roll and Hip Shingles and Ornamental Ridging . . . Ridge and Hip Tile . . . Finials . . . Barn Batten . . . Building Corners . . . Roof Edge and Eaves Drip . . . Flashing . . . Shingles . . . Galvanized, Black, and Milcor Blue Sheets.
MILCOR STEEL COMPANY
MILWAUKEE 4, WISCONSIN
Baltimore 24, Md. • Chicago 9, Ill. • Kansas City 8, Mo.
Los Angeles 44, Cal. • Rochester 9, N. Y.
. . . equipped to provide additional service through
THE J. M. & L. A.
OSBORN Co.
CLEVELAND 14, OHIO
DETROIT 2 • BUFFALO 11 • CINCINNATI 25
— a Division of Milcor Steel Company
G-95

the trend is to

Coordinated Controlled Heating

UNDER ONE TRA

New Heating Designs Feature Preselected Controls Sold as an Integral, Coordinated Part of the System

"Coordinated Controlled Heating" is based on the same successful merchandising idea used by automobile, radio and other industries to build high sales volumes and greater public acceptance. It is becoming increasingly popular among progressive heating manufacturers because they realize efficient performance can be assured only by careful preselection of automatic controls which are engineered for and coordinated with the particular combustion characteristics of their heating systems.

HOW DEALERS INCREASE HEATING SALES

Dealers particularly recognize the value of "Coordinated Controlled Heating" for increasing sales and assuring greater user satisfaction. It simplifies selling by avoiding confusion in the buyer's mind when heating equipment and controls are offered under separate names. Thus controls become a powerful, integral part of the sales story . . . not a side issue requiring long explanations. One name wins prospects' confidence, assures them of undivided responsibility and minimizes sales resistance because this is the way they are accustomed to buy other merchandise.

If your manufacturer is supplying preselected controls on equipment you sell, **be sure to install only controls bearing his trade name.** If not, ask him to equip the units you sell with "Coordinated Controls" now.

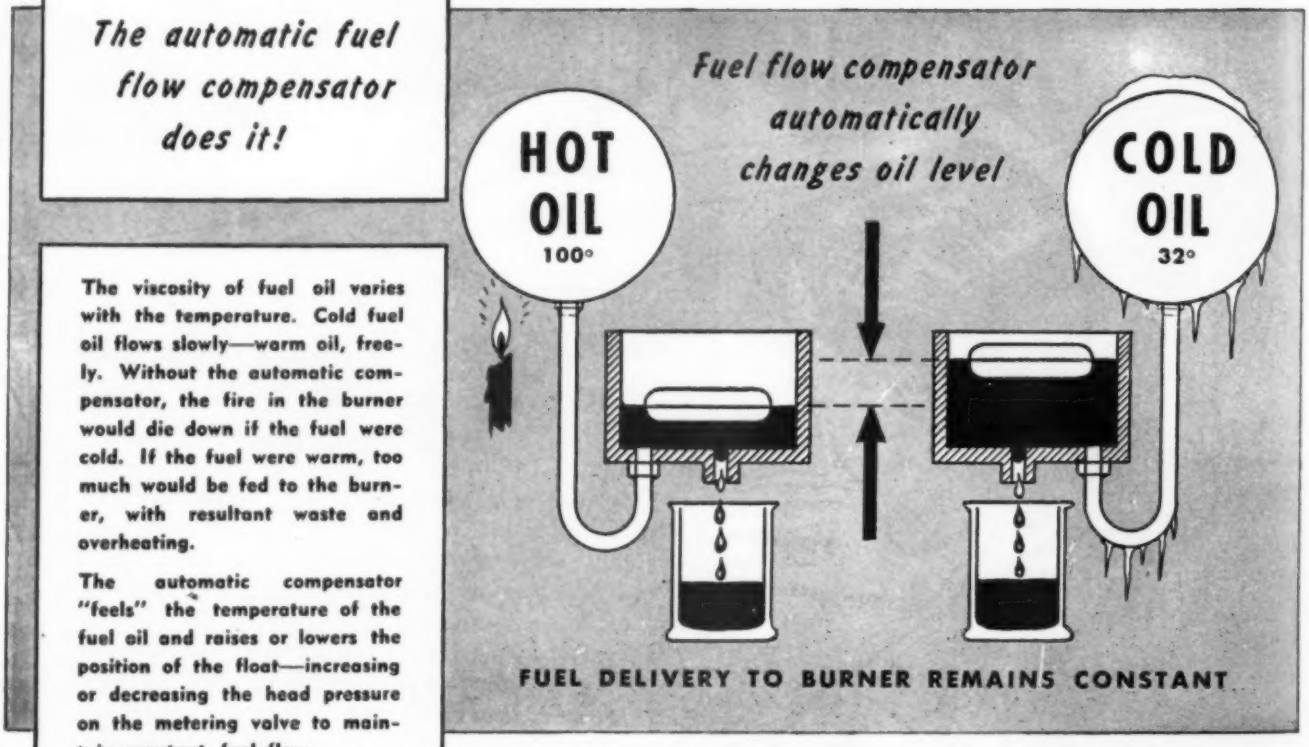
Perfex

WISCON

G SY

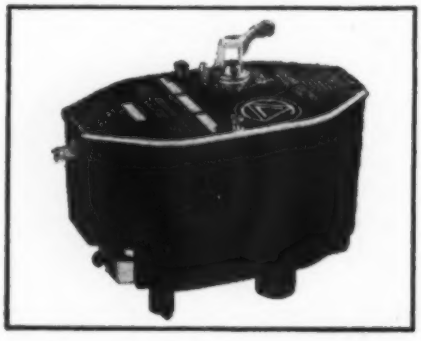
Steady, even fuel flow regardless of oil temperature with "DL" FLOAT VALVES

The automatic fuel flow compensator does it!


Fuel flow compensator automatically changes oil level
HOT OIL 100°
COLD OIL 32°
FUEL DELIVERY TO BURNER REMAINS CONSTANT

The viscosity of fuel oil varies with the temperature. Cold fuel oil flows slowly—warm oil, freely. Without the automatic compensator, the fire in the burner would die down if the fuel were cold. If the fuel were warm, too much would be fed to the burner, with resultant waste and overheating.

The automatic compensator "feels" the temperature of the fuel oil and raises or lowers the position of the float—increasing or decreasing the head pressure on the metering valve to maintain constant fuel flow.



THE automatic fuel flow compensator consists of a piece of thermostatic bi-metal which supports the float. When the fuel oil is cold the bi-metal warps and raises the float—allowing the oil level in the float valve body to rise. When the fuel is warm, the bi-metal compensator warps in the opposite direction, lowering the float and consequently the liquid level. Since the fuel delivery through the metering orifice depends upon the head pressure above the needle and the viscosity of the oil, this action of raising or lowering the float results in a uniform rate of fuel delivery regardless of fuel temperature.

This method of compensation, using the temperature of the fuel, is an important feature.

It is but one of the many reasons why you should insist upon "DL" equipped heaters when you are selecting a line to sell.

DETROIT LUBRICATOR COMPANY General Offices: DETROIT 8, MICHIGAN

Canadian Representative—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators.

"when happy days are here again!"

. . . . . will you be "CASHING IN" with the HALL-NEAL VICTOR LINE ?

Investigate US Now!

Now's the time to make your investigation and plan your postwar heating equipment line. Do it now and be "set to SELL" when the time comes. It's coming! Our boys are seeing to that and you owe it to yourself to acquire the best, quality-built, fastest selling equipment you can find and to do it NOW! What chance will you have to get any line at all . . . if you wait too long?

Put the proof of these statements UP TO US . . .

- **That Hall-Neal Victor furnaces . . . the FURNACES with the Heat Radiating "FINS" . . . are *recognized* as one of the finest furnace lines ever built. There is no finer furnace built!**
- **That Victor "FINS" do give MORE heat from LESS fuel than any conventional furnace. That means more heat for LESS MONEY . . . a *fact* which clinches sales!**
- **That the Hall-Neal miniature table-top "FIN" demonstrator proves before your prospect's eyes the *ADDITIONAL, FREE* heat he will obtain by buying a VICTOR with heat radiating FINS. It makes more sales . . . more profits . . . for you!**
- **That our staff of six, practical, experienced heating engineers furnishes you with workable heating layouts promptly when you need them. Headed by Guy A. Voorhees, this department is always at your service to solve your technical problems . . . to help you SELL!**
- **That the Hall-Neal Victor line is so complete in sizes (up to 2,250,000 B. T. U.'s), quality, accessories and price range that you will need no other in order to make more money when those happy days are here again! WRITE US, *NOW!***

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1326 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

Over the years of steady progress in the development of better gravity furnaces Rybolt Series 15 has always been outstanding for its efficient and economical performance.

It is shown here, not as a Rybolt postwar product, but as a symbol of Rybolt prestige for quality and dependability in the heating field.

In the postwar model, the Rybolt gravity furnace will embody many important new improvements and refinements developed by our engineering staff. This applies also to the complete Rybolt postwar line of warm air heating and air conditioning units — fired by all permitted fuels — for all home heating requirements. As a better line throughout it will represent unusual sales possibilities for you.

BUY AN EXTRA WAR BOND

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

Weirzin offers you a great business advantage. It enables you to manufacture a demonstrably better product at an appreciably lower net cost.

ONE SAVING . . . The high corrosion resistance of Weirzin means a substantial saving in inventory, plus reduced cleaning costs and the *elimination* of pickling and buffing operations.

ANOTHER SAVING. Because of its extremely tight malleable coating and highly ductile base sheet Weirzin takes deep drawing and severe fabrication without damage to its protective surface—and retains its excellent base for subsequent finishes . . . *and* because it is available plain or Bonderized in coils up to 35" widths Weirzin lends itself to fast, automatic production equipment . . . Write for test sample.

WEIRTON STEEL CO.

WEIRTON, W. VA.

Division of **NATIONAL STEEL CORPORATION** *Executive Offices · Pittsburgh, Pa.*

LELAND ELECTRIC COMPANY
Engineering Department Report
ASSIGNMENT:
To provide airborne power units for radar, automatic pilot, gyroscopic compass, fluorescent lighting, and to operate from main electrical system of aircraft.
SOLUTION:
Leland engineers designed special light weight, highly efficient inverters converting direct current to 400 or 800 cycle alternating current with controlled frequency and voltage regulation. Radio interference was held to a minimum.
NOTE TO HEATING AND AIR CONDITIONING ENGINEERS
This example of Leland Creative Electrical Engineering indicates our ingenuity and ability to solve your specific problem with custom-designed power equipment.
if it calls for
CREATIVE ELECTRICAL ENGINEERING...
call for Leland!

THE Leland ELECTRIC COMPANY

DAYTON, OHIO • IN CANADA, LELAND ELECTRIC CANADA, LTD. . . . GUELPH, ONTARIO

YOU'RE TALKING BUSINESS WHEN YOU TALK MONCRIEF

MONCRIEF
SINCE 1895

Yes—"Moncrief" in the heating trade means business—profitable business.

For 50 years Moncrief products have been accepted in the heating market as fast moving, quality products.

Moncrief products have given hundreds of thousands of home owners, efficient, economical heating.

Moncrief has always given the biggest dollar value possible to you and your customer.

Moncrief has always been a leader in design . . . construction . . . service.

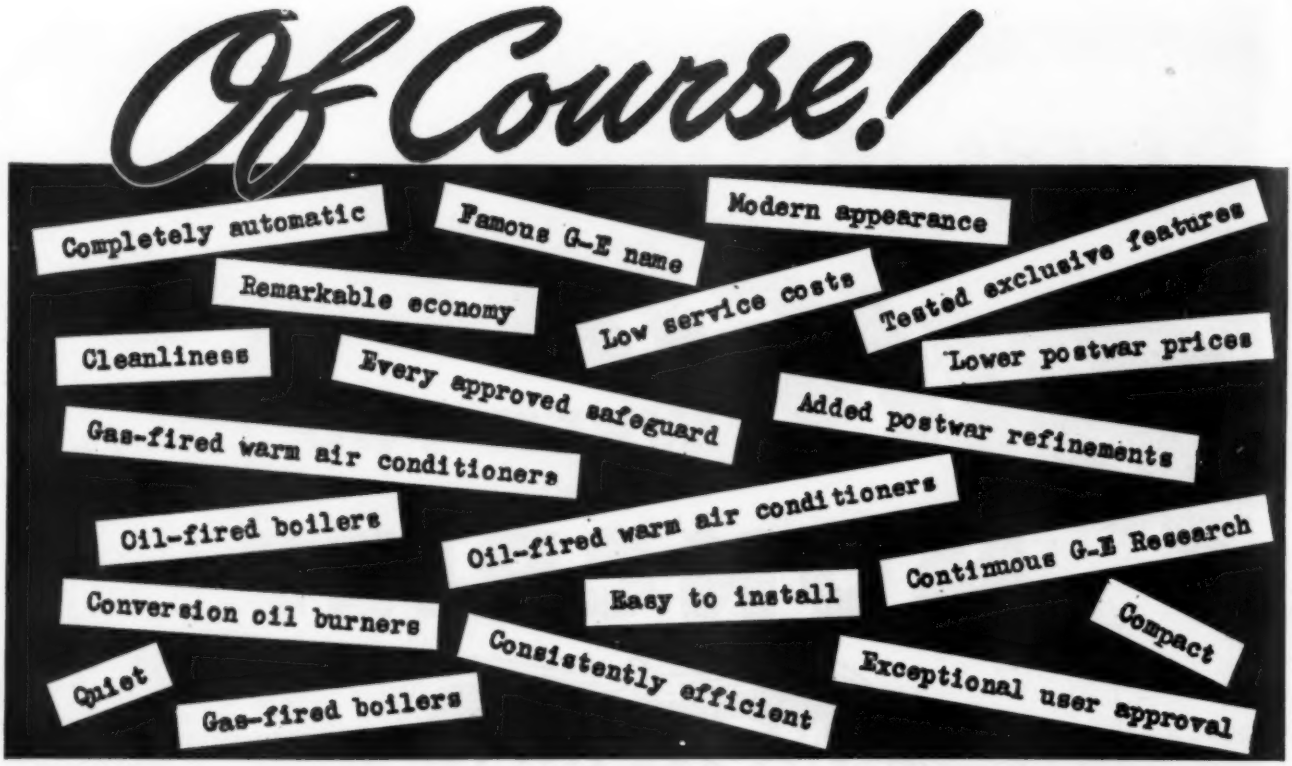
The heating market is open to you—you can talk business when you carry the nationally recognized line of Moncrief heating equipment, furnace pipe and fittings.

A Moncrief line means—more sales
—greater profits—a sound future

THE PRE-WAR MONCRIEF LINE OF FURNACES AND AIR CONDITIONING UNITS

Series C Coal Fired Cast Gravity Furnace | Series 600 Coal Fired Steel Gravity Furnace | Series C Coal Fired Cast Gravity Furnace | Series S Coal Fired Cast Air Conditioning Unit | Series G Gas Fired Cast Air Conditioning Unit | Series GG Gas Fired Cast Gravity Unit | Series HBG Gas Fired Cast Utility Air Conditioning Unit | Series Special Oil Fired Steel Air Conditioning Unit

THE HENRY FURNACE CO. MEDINA, OHIO



These buying points for the home-owner are selling points for YOU!

FEW postwar markets look more inviting to dealers than the markets for domestic heating equipment. Be as conservative as you will... the replacement market, the market of privately-built new homes, the market in large-scale development projects, all hold prospects of record-breaking sales when production can be resumed.

And no dealers, we believe, are better placed to share this business than the fast-expanding list of G-E dealers.

Why? Just look over the "points" in the panel above!

General Electric engineers put years of research into G-E Boilers, Burners, and Warm Air Conditioners before they were offered to the public . . . then more years checking operating results under widely varying conditions in homes of many types. No prewar heating units that we know of offered more to the home-owner... yet laboratory research and painstaking test have steadily perfected further refinements, reduced fuel consumption, lowered production and installation costs.

If you hold a G-E Franchise . . . congratulations! We think you have a good opportunity to hit the jack-pot. If you haven't signed up . . . there may be some good spots still open; better inquire. For as one dealer told us, "when the name on it is *General Electric* . . . say, half the selling battle's over!"

General Electric Company, Domestic Heating Division, Section 5534, Bloomfield, N. J.

BUY...and hold...WAR BONDS

GENERAL ELECTRIC

Automatic Home Heating

Tune In: "The G-E HOUSE PARTY," every afternoon, Monday through Friday, 4 p. m., EWT, CBS..."The G-E ALL-GIRL ORCHESTRA," Sundays, 10 p. m., EWT, NBC... "THE WORLD TODAY" News, Monday through Friday, 6:45 p. m., EWT, CBS

● Well and favorably known for the fact that it doesn't have to pull its punches either. These strong, sturdy tools with their rugged drop-forged jaws can deliver plenty of wallop without showing the least strain. They're hard to find now—but we won't go into that—you know the reason just as well as we do. Like the other famous members of the Crescent Tool family, they will some day be back on the shelves of progressive hardware dealers everywhere. In the meantime, let's sock the Axis with everything from War Bonds and waste fats to mountains of waste paper.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

ARMY E NAVY

The sheet shows its stuff

Bethlehem Steel Sheets have made a lot of friends during this war. Men who work with all kinds of sheets—sheet-metal contractors, heating and ventilating contractors, makers of formed products—have found that Bethlehem Steel Sheets saved them time, trouble and money, on jobs that have been much more tricky and demanding than are normally encountered in peactime experience.

Yes, these sheets have shown plenty of stuff—uniform quality and dependability—ease in forming and seaming—ability to take deep-draws much more drastic than were believed possible a few years ago.

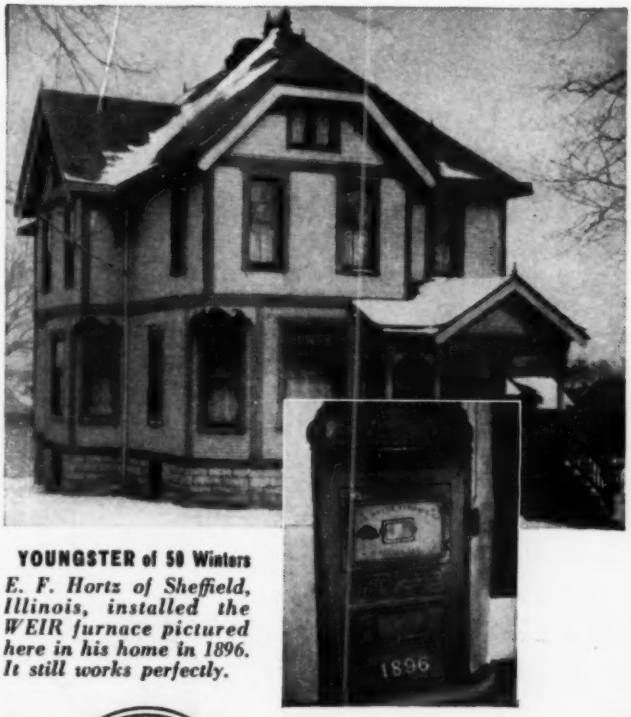
Plan to use Bethlehem Sheets for your postwar contract work or products. There's a Bethlehem Sheet which will suit your needs—and do its job with ease and efficiency.

BETHLEHEM STEEL

Bethlehem Steel Sheets

VETERANS
STILL IN SERVICE

WEIR-MEYER dealers and distributors need only point out the record behind WEIR-MEYER Furnaces! Their veteran performance is the direct result of finer manufacturing . . . greater experience. These outstanding records speak for themselves and provide WEIR-MEYER dealers with powerful, effective sales advantages!



YOUNGSTER of 50 Winters

E. F. Hortz of Sheffield, Illinois, installed the WEIR furnace pictured here in his home in 1896. It still works perfectly.

THE MEYER FURNACE COMPANY · WEIR MEYER · PEORIA, ILLINOIS

CONSTANT LEADERSHIP

Years of "know-how" assure WEIR-MEYER distributors and dealers of equipment that will capture post-war markets.

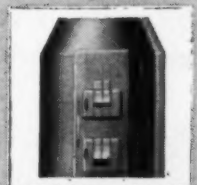
If you want a complete line of Warm Air heating and Air-Conditioning equipment that gives the consumer greatest value, that gives you legitimate profit and enthusiastic customers, investigate WEIR-MEYER.

You may be in territory not already served by a WEIR-MEYER dealer. Write today. It is the first step toward postwar leadership in your town.

THE MEYER FURNACE CO.

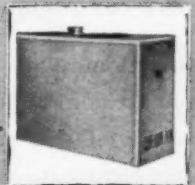
Weir and Meyer Furnaces—Air Conditioners for COAL—GAS—OIL Peoria 2, Ill., U. S. A.

For all Fuels COAL-GAS-OIL



WEIR U Series STEEL FURNACE. Famous WEIR riveted and welded construction. Exclusive, entirely new features.

MEYER Gas-fired AIR CONDITIONER. Built for efficiency and durability. Easy to install. Finer performance. Greater convenience.



MEYER Oil-fired AIR CONDITIONER. Gives the user of oil a new conception of cleanliness, efficiency, economy of operation.

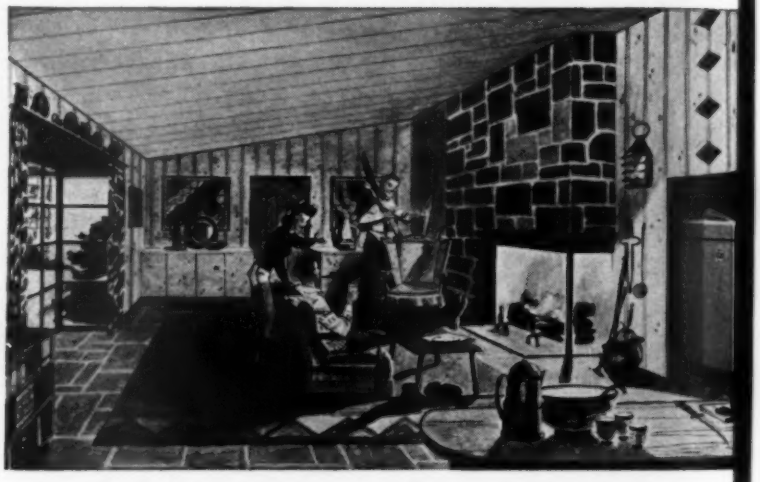
WEIR-MEYER MEANS *Modern Heat*

"You have something every dealer will want!"

Lionel Jacobs—a Timken Silent Automatic Dealer and owner of one of the largest automatic heating businesses in the East—writes:

"The more I think of the future plans and strategy for use with Timken Silent Automatic products, which you discussed with me in your office last week, the more I realize you are right on the beam.

"I know of no other company which aids dealers in so many ways—with sales, with service problems, in business management, in hiring and training of salesmen, in laying out jobs to get the best heating results and even in training mechanics to install and service properly. Take it from me, you have something that every dealer will want when retail selling is resumed.



New U-Shaped Home, designed by Harold H. Ehlert, A.I.A., noted Detroit architect. One of a number of new homes by leading architects featured in Timken Silent Automatic national magazine and newspaper advertising.

"After talking with the engineering and research department heads, I'm convinced they will live up to their fine reputations of the past, and that we'll have everything that's new, improved and practical *productwise* to offer our customers.

"I want to congratulate you, too, on the splendid advertising job you are doing. We are getting evidence every day of the interest it is creating. Keep up the good work. We appreciate it.

"The thousands of owners of Wall-Flame Burners here certainly appreciate Timken Silent quality. They enjoy the extra heat (and comfort) they are getting from their rationed allotments of oil.

"They realize, as we do, that you have built many extra years of service into your product. That is why our customers were willing to pay more for a Timken."

Would you like to hear all the reasons why people are willing to pay *more* for Timken quality? Would you like to know how much more profit you can make with the Timken Silent Automatic franchise? Write us NOW and arrange an interview. There is no obligation.

TIMKEN

Silent Automatic

Quality Home Appliances for Comfort, Convenience and Economy • 20 Years of Faithful Service to American Homes

Division of THE TIMKEN-DETROIT AXLE CO., Detroit 32, Michigan

Yes! a big PROFITABLE market, easy to REACH and SELL!

A big market today (and one bound to grow tremendously in the Postwar Period) is the market for DUST-STOP Air Filters — the *1,700,000 homes* equipped with *forced-warm-air* furnaces.

Averaging two to three filters per unit and these needing *replacement at least once a year*, this filter business runs into volume and can make you some money. Better yet, it can help you get extra "service" business and *get it when you want it.*

Practical promotion plans, built around effective mailing pieces and other proved selling helps, make it easy for you to go after this business. Ask your DUST-STOP Wholesaler to show you the new FREE DEALER HELPS! Plan *now* to boost summer sales and profits with a timely DUST-STOP Promotion Program.

Owens-Corning Fiberglas Corporation, 1930 Nicholas Building, Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ont.

DUSTOP AIR FILTERS
—a FIBERGLAS product

*T. M. Reg. U. S. Pat. Off.

Every owner of a forced-warm-air furnace needs two or more Dust-Stop Air Filters . . . at least once a year.

Allegheny Stainless - Quickly from Stock

Ryerson stocks of Allegheny Stainless Steel include sheets, plates, bars, angles, tubing and pipe in a wide range of types, finishes and sizes. Facilities for cutting and otherwise preparing this stainless steel for your requirements are unsurpassed. All stocks and shipments are carefully protected against surface damage.

Allegheny was the first stainless steel made on a production basis. Experience gives it the highest rating for uniform high quality and workability.

Stainless steel stocks at Ryerson Plants have been greatly increased and quick shipment is assured. Service from each Ryerson Plant is supplemented by service from the other ten.

Technical bulletins on any type of Allegheny Stainless are available. Expert counsel from Ryerson engineers and metallurgists on any problem of stainless steel selection or fabrication is yours on request. Write your nearest plant.

Have you a Ryerson Stock List?—includes more than 10,000 kinds, shapes and sizes of steel.

RYERSON CERTIFIED STEELS

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC., Steel-Service Plants at: Chicago, Milwaukee, St. Louis, Detroit, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, Jersey City, Boston.

Carbon and Alloy Steels • Tool Steel • Allegheny Stainless
Bars • Shapes • Plates • Sheets • Tubing • Structurals

"Zero" Hour for Warm Air Heating

BEGINNING on the next page, American Artisan reports the outlook—as of March—for furnaces, pipe and fittings, registers and grilles, blowers and motors. This report is based upon the curtailment in production volume caused by the cuts in materials which apply to the second quarter and on the possibility that similar reductions in materials may continue throughout most of 1945.

Under each individual report a warning has been included pointing out that the present condition can change swiftly and that any change will probably be for the better so the industry should keep such a possibility in mind in its 1945 planning.

American Artisan's opinion is that if the major fighting in Europe winds up by June, those persons and agencies in Washington who now seem determined to keep production of civilian goods at a minimum won't be able to sustain their position in the face of the pressure for jobs which is bound to come if war goods production is cut back 20, 30 or 40 per cent—as now seems likely.

Already some reductions in war goods programs have released men for other employment. The drastic cut in production of ships in mid-west plants is a case in point. Several thousands of ship yards workers are already seeking new jobs. For the time being, at least, these workers are needed in other war goods plants, but, conceivably, there will come a time when war plants cannot absorb these workers and they must find work in civilian goods programs.

But the fact of most importance to our industry, and the development which can cause our industry the greatest headache in 1945, we believe, is the matter of *timing*.

What we mean by the timing problem is this—supposing, as many forecasters now state, the active fighting in Europe ends in May or June. Consumption of munitions and equipment will be sharply reduced. Cuts in production will come, but likely it will take three or four months before the armed forces figure out what they need and these cuts work back to actual stopping of production. That means midsummer Then WPB will need another month or two to translate these cuts into actual materials released and to establish materials flow into civilian goods. So August or September has arrived—that's the end of the third quarter and almost too late to affect fourth quarter allotments of materials.

And keep in mind that August and September are almost the end of the season in which repair, replacement, and service should be pretty well covered to be ready for next heating season.

On this schedule, contractors will not have been able to get the furnaces required for replacement. Repair parts may have been slow in coming through so repair work has lagged. We may have secured more help, but help without material and equipment is only half the problem.

Fortunately for us, our manufacturers, generally, are not faced with the problem of lengthy reconversion and re-tooling. When they get material and men, they can shift to production of our equipment in a few days' time. Therefore, any speeding up in the timetable sketched above should be immediately reflected in more equipment we need.

Although the "spot authorization" order (PR-25) is now suspended, it can be quickly reinstated and, according to some authorities, will be the "tool" used to hurry civilian industries over the period when the studied and final plans are being worked out.

This spring and summer can be the most uncertain period our industry has faced to date. And it can be a heart-breaking period because victory is so certain and normal business so near, but yet so far. It will be a period which calls for serious planning—especially by contractors—who must plan what they can do to render the utmost service in the face of serious obstacles.

Contractors cannot meet this situation if they let matters slide along but each contractor to his own clientele can, however, do this: urge that fires be shut down as early as possible; urge owners to take care of their smoke pipe; push owners to place inspection orders so that needed new furnaces, new parts will be revealed as early as possible so orders can be placed; lay careful plans to sell control equipment throughout the summer and dovetail control sales in with repair work to obtain maximum return from manpower; keep a detailed record of work needed, but impossible to do, so that when material and men are available the work can be scheduled immediately; and, finally, make every furnace, every repair part, every sheet of iron count.

Washington Report on Heating Equipment

Last December, it seemed 1945 would continue with pretty much the same supply of materials and labor available in 1944. But in January and February, as a result of the military set-back in Europe, our industry and all other civilian durable goods industries received cuts in materials of alarming proportions. Our picture has changed. The information which follows was gathered in Washington by American Artisan during the last of March. The picture, as of March, is disturbing, but we should remember that another change — for the better — can come any day and just as swiftly as came the change in the first quarter. We should consider the present situation perspectively and be prepared for reconversion.

TOWARD the end of 1943 it became apparent that material scarcities and manpower shortages were going to cut production of warm air heating equipment below the anticipated needs of the industry for 1944. From information gathered in Washington, a study was made which showed that not more than 200,000 replacement furnaces could be hoped for. A report of the situation was published in the October, 1943, "American Artisan" and in following issues a method was suggested whereby these 200,000 replacement furnaces might be equitably distributed by counties.

At the end of 1944 a re-check was made disclosing that just about 200,000 furnaces for replacement had been made available. At the same time a check was made on the possible production for 1945 — this showed that production had slowly increased in the fourth quarter of 1944 due to some additonal material obtained under "Spot Authorizations" (PR-25) and a relatively stable manpower condition.

So last January it appeared that our industry might expect, in 1945, about the same number of furnaces (200,000) for replacement purposes. But we reckoned without the violent swing to pessimism stemming from the military setback of December and few persons foresaw the complete dominance of civilian production which was assumed by the military in January and February.

In the first quarter of 1945 all civilian goods producers were shocked to find their second quarter material allotments drastically curtailed. How drastically our manufacturers' allotments were curtailed is clearly set forth in the separate reports on furnaces, pipe and fittings, registers and grilles, blowers, and motors, which follow.

These curtailments are definitely alarming (140,000 replacement furnaces

is something to think about) but before readers make up their minds to accept the worst, it may be well to take a look at what is behind the situation:

(1) There must be some truth, because there has been so much gossip, in the statements that the military have been trying ever since the war started to dominate all manufacturing and tell each manufacturer what he shall make and how many.

(2) Until the last December setback, the military had failed to attain this objective—now the military is definitely in control of everything.

(3) The military fears — rightly or wrongly — that if civilians are permitted to feel that the war is "in the bag," production of equipment needed for the Pacific war will slump drastically — therefore the military wants civilians to keep feeling there is no end to our war needs.

(4) There is no doubt but that the military will keep tight hold on all civilian production as long as possible.

(5) Based upon last December's reversals, the military has "upped" requirements of practically all war items to fantastic figures — we all want our fighters to have more than enough of everything — but we can't finance and we will, sooner or later, demand to know that military purchases are necessary.

(6) There is undoubtedly a serious reduction in steel production (90,000 tons per week below the average rate of last October and November). Coupled with the greatly increased demands for war we now have steel mills heavily overloaded with orders and delivery dates greatly extended.

But it has been shown time and time again that even such a serious outlook can change practically overnight and there are many men in Washington and in industry who really believe steel salesmen will be camping on industry's doorstep within days after the European war ends.

(7) Finally, and most important, as this issue goes to press, the war in Europe seems in its final stages and may end any day. When it ends there will have to be drastic alterations in military's needs. We simply can't shift from Europe to the Pacific overnight and we can't consume all the material we are now throwing at the Germans.

For this reason, many authorities firmly believe that the 15 per cent cutbacks the military is now publicizing will simply have to increase to 25, 35, maybe 40 per cent of present schedules.

We will want to, and we will have to cut some heavy production schedules to give men and machines a much needed "rest" — even with such a drop there will be some materials "running out our ears."

(9) Despite the complete dominance of the military in Washington, there are many persons in high office who continue to feel that it is a mistake to let all our post war planning wait until victory. They know and they continue to point out — it takes time to reconvert; perhaps more time than it took to convert to war production—we should, then, continue post war planning insofar as we can and Washington should, as soon as possible, make such planning possible and the patriotic thing to do.

"American Artisan" believes the above is a fair, though brief, analysis of the situation. The plan this industry should follow might be —

(1) Make your plans as though 1945 will be as tough as it now seems.

(2) But do everything possible to be ready if and when the pendulum swings back to optimism and common sense.

WASHINGTON REPORT PAGE 3

Furnaces

The information which follows is the situation in March. V-E admittedly can swiftly revise the entire program upward and re-establish the reconversion program now dormant.

IN 1944 our industry *produced* some 276,000 warm air furnaces—147,000 cast iron and 110,000 steel; coal, oil, and gas. Approximately 27 per cent of these were used in new war worker houses, or about 75,000 furnaces. In 1944 we produced about 12,000 gas furnaces—both cast iron and steel and a few oil-fired, central furnaces.

So we had left for *replacement* purposes in 1944 about 200,000 warm air furnaces. All this was forecast by AMERICAN ARTISAN in October, 1943, and substantiated month by month throughout 1944 as reports were released.

Throughout 1944, production of furnaces continued at a fairly uniform rate—something like an average of 23,000 furnaces of all types each month. This average of 23,000 furnaces per month gives an average *quarterly* rate of 68,000 furnaces per quarter. This figure is important to keep in mind in analyzing the 1945 situation because the materials allocations and cuts are all calculated on a quarterly basis.

Throughout the first quarter of 1945—January, February, March—materials were available on much the same basis as the fourth quarter of 1944; manpower did not change much—so we ended the first quarter of 1945 with a total production of just about 64,000 furnaces.

But in the first quarter, the material cuts were announced. For furnace manufacturers in Labor Areas 1 and 2, the cut in materials was 50 per cent—practically across the board. For furnace manufacturers in Labor Areas 3 and 4 there was no cut.

Statistics compiled over the years show that about 75 per cent of all furnace production (central type) comes from Labor Areas 1 and 2. So 75 per cent of 68,000 (our average quarterly production) equals 51,000. Since this production had its materials cut 50 per cent, we can anticipate 50 per cent of 51,000 or roughly 25,000 furnaces for the second quarter from Labor Areas 1 and 2. If Labor Areas 3 and 4 produce 25 per cent of 68,000, this is 17,000 furnaces, and since materials were not reduced for these manufacturers, we will get the 17,000 furnaces for the second quarter.

This gives a quick total of 42,000 furnaces for the second quarter.

Some agencies in Washington profess to see inventories of furnaces and materials not used in the first quarter which, if they exist, may raise the final second quarter total production to 60,000 or better. How much accuracy there is in this feeling, we do not know.

Barring developments in the war which we cannot foresee, it is quite possible that total materials production (mostly carbon steel) will not increase throughout the year, and if so, the need for curtailment in civilian goods will continue. Should this prove so, total production in the third and fourth quarters will be about the same as in the second quarter so on this basis we will have final production of 64,000 plus 42,000 plus 42,000 plus 42,000 or 190,000 furnaces, all types, all fuels, all uses.

This is not the most optimistic view; neither is it the most pessimistic. The optimists believe raw steel production should increase; there may be relaxation from army, navy, etc., all of which will boost furnace production up toward the 250,000 total. The pessimists see no relaxation in demands from the armed forces—in fact, they see increased demands. Strikes, floods, other causes may cut basic steel production. Manpower problems may become more acute. If these things happen, 1945 furnace production will fall to 150,000 total.

If it seems emphasis is put on steel and steel furnaces in the statements above, the reason is we know cast iron furnace manufacturers are now producing to their maximum capacity and their labor problems are acute. Therefore, there is little hope this year for more cast iron furnaces no matter what happens in the war and we must look to steel furnace production for any quick or substantial increases over present expectations.

On the basis of 190,000 furnaces produced, it seems war housing needs as visualized by NHA, FHA, FPHA will again take 27 per cent of all furnaces produced or 51,000 furnaces.

This leaves us about 140,000 furnaces for replacement purposes.

Manufacturers' Problem

Manufacturers in Labor Areas 3 and 4 will find themselves, on this basis, facing just about the same production problems as they had in 1944 and in the first quarter. But manufacturers in Labor Areas 1 and 2—and without war work—seemingly will have to decide whether to continue production at first quarter level until they run out of material and then shut down or they will have to decrease weekly production and working hours and thus hope to keep their working force together. The first alternative means losing men—probably for good—without much chance to hire new help in the next quarter.

Manufacturers who have war work can probably shift men from furnaces to war work and back again and thus work out the problem. They may also seek to increase their volume of war work.

Contractors' Problems

The 1944-1945 heating season was severe—extremely severe in many areas. And this last season was the third one this industry has faced with *too few* replacement furnaces. Contractors have, without doubt, patched and repaired far beyond all customary practice. There must be thousands of furnaces which should have been replaced last winter or the winter before, but have been repaired. How much longer this

can continue without serious disruption in civilian health and comfort is a very serious question.

Reports of "hardship" cases reaching WPB in Washington and local WPB offices throughout the country last winter were surprisingly few. This could mean that contractors really tried to stretch the 200,000 replacement furnaces we had in 1944 and repaired as suggested beyond a reasonable limit.

But now we face a coming 1945-1946 heating season with still less expectation of getting the replacement furnaces we need so badly.

What can we do about it?

The answer is not easy. In October, 1943, AMERICAN ARTISAN suggested that the 200,000 replacement furnaces then in sight for 1944 be distributed as equally as possible on the basis of furnaces in use in each county of the country. Tabulations were published showing how many replacement furnaces this gave in each of the more than 3,000 counties of the country. We can still use these figures, but take only 75 per cent of the number and again determine the number of replacement furnaces each county is entitled to if we get only 150,000 furnaces for replacement in 1945. It won't be many furnaces in many counties.

Repair Parts Situation

All of the above is suggested on the strength of there being as many repair parts available in 1945 as in 1944. But this is by no means certain.

First of all, repair parts for cast iron furnaces and grates and fronts for steel furnaces come from foundries. The foundry situation is definitely handicapped by labor shortages. The foundries which make a specialty of repair parts say their chances to step up production are poor. The manufacturers who make repair parts for their own furnaces and perhaps some others see just as little chance to increase production.

Washington has no definite figures, but is not optimistic.

In the face of this situation contractors can do only one thing—begin repairing just as soon as the fires are down and hammer home to customers that it may take weeks or months to get repair parts—order now. Further, with contractors suffering from serious manpower shortages, it will be necessary for every furnace dealer to make every hour of every day count—there must not be days or weeks when repair jobs lag. This means the dealer must lay plans to actively solicit repair work all through the summer.

Smoke & Furnace Pipe, Registers

The information which follows is the situation in March. V-E admittedly can swiftly revise the entire program upward and re-establish the reconversion program—now dormant.

WASHINGTON REPORT
PAGE 4

THE Stove and Furnace Smoke Pipe Industry Advisory Committee has warned WPB that because of the curtailment in materials for second quarter production and in view of the seeming continued material restriction throughout 1945, there may develop this year a very serious shortage of stove and furnace smoke pipe. How serious this can be is plainly indicated in the following statistics.

In recent years there has been converted to stove pipe and furnace smoke pipe and to registers and grilles and to warm air distribution pipe the following tonnages of materials:

1941—135,000 tons
1942— 56,000 tons
1943— 86,000 tons
1944— 96,000 tons
1945— 70,000 tons

The last figure—70,000 tons for 1945—is based upon a first quarter equal to the fourth quarter of 1944 plus the serious reductions in materials which have been announced and indicated on manufacturers' advanced allotments.

Of these tonnages, the breakup into various products is about as follows (1944 figure used as typical):

Stove pipe	45 per cent
Galvanized smoke pipe	30 per cent
Furnace pipe and fittings (prefabricated)	16 per cent
Registers and grilles	7 per cent
Miscellaneous	2 per cent

This must also be considered: quite likely 15,000 tons of this 70,000 total for 1945 will be received by manufacturers in the fourth quarter—too late perhaps to be of much use to owners because after receipt the material will have to be put into production by manufacturers.

It is not felt by industry advisory committee members that there is much if any stove pipe and furnace smoke pipe left in contractors', jobbers' or manufacturers' inventories—the pipe was sold and installed as fast as produced all through last winter. There will, then, be no backlog to use this summer and scarcities will develop.

Assuming that 75 per cent of the material used in 1944 (96,000 tons) was converted into stove and furnace smoke pipe that would be 72,000 tons used, and nothing was left over. Now, we have the possibility of only 70,000 tons in total for 1945. On the basis of 1944 use, all of the material we foresee this year will be needed for stove and furnace smoke pipe. This leaves little material for warm air distribution pipe or for registers and grilles, excepting as manufacturers find idle or excess materials or, most likely, the serious shortage is recognized in Washington and materials for registers and grilles are transferred from less critical products.

How to get along with less stove and furnace smoke pipe has not been answered. Many, many house owners tramped from door to door last fall for stove and smoke pipe; the need this winter seems just as widespread. So it looks as though manufacturers must and probably will concentrate first on production of stove pipe and furnace smoke pipe.

There may be many new houses built and stacked,

but there may not be leader pipe unless the contractor fabricates leader pipe from sheets. And there may be many houses without any registers and grilles. Bad as such a situation may be, it goes without question that stove pipe and furnace smoke pipe must come first, for without these, furnaces can't be operated.

Contractors Can Help

In the light of these findings, contractors can do this to help: urge all customers to take down their stove pipe and furnace smoke pipe as soon as the fire is out. Clean the pipe, oil or paint it, and store the pipe in a dry place until next fall. So treated, that pipe may last through next winter. If neglected, a new smoke pipe line will be necessary. Any contractor looking for an excuse to ring a doorbell or send a postal card ought to find this idea of smoke pipe care a good attention getter.

Also, contractors with sheets can help themselves by making up furnace smoke pipe—even a few dozen lengths may be just the amount contractors won't be able to buy next fall.

Contractors might also do this: if any lengths have pitted in one end, but the other half is good, don't throw the whole length away—save it, crimp it and make it fill out a run.

WASHINGTON REPORT PAGE 5

Blowers

The information which follows is the situation in March. V-E admittedly can swiftly revise the entire program upward and reestablish the reconversion program—now dormant.

ONE major change has taken place this year in the furnace blower situation; last year steel was reasonably free, but scarcity of fractional horsepower motors drastically limited furnace blower production. Now, as a result of the scarcity of steel, blower manufacturers have had their steel allotments cut and lack of both steel and motors will still further curtail blower manufacture.

There has been no change in limitation orders which prescribe the conditions under which a furnace blower may be sold. Contractors can still, under L-79, replace non-repairable or worn out blowers by automatically extending to his supplier an AA-3 rating, but blowers so ordered cannot be furnished with motors by either the manufacturer, the jobber or the installer. If the old motor is also unrepairable, the repairman may order a new motor under CMP-9a making the replacement on an exchange basis as prescribed under L-123. Maximum size blower covered in this procedure is a 16-inch diameter wheel.

Repair parts for furnace blowers may be ordered by the installer under CMP-9a by extending to his supplier an AA-3/V-3 rating.

There is no way at present whereby a home owner (city or farm) who never has had a blower may buy a furnace blower without approval. City owners must apply to FHA local office on form WPB-2896 giving reasons for request. If approved, an AA-3 rating will be granted. Farm owners should apply to local county Agricultural Conservation Committee on form WPB-617.

Original installation in factories, stores, commercial or industrial establishments is permissible—without approval—under CMP-5 (business) or CMP-5a (service) if the cost of the installation does not exceed $200. This $200 limit practically eliminates automatic procedure because such establishments usually require a pretty good sized blower and some revamping.

Where the cost is over $200, the end-user applies to WPB on form WPB-617. The regulations here are rather complicated—discuss the problem with WPB and have WPB determine the classification permissible under L-41, which is the overall controlling order.

WASHINGTON REPORT PAGE 5

Motors

The information which follows is the situation in March. V-E admittedly can swiftly revise the entire program upward and re-establish the reconversion program—now dormant.

PRODUCTION of alternating current, fractional horsepower motors increased progressively throughout 1944 until, in the fourth quarter, production reached 450,000 motors per month. This compares with an average production in 1943 of 250,000 per month.

However, while production was increasing, so was demand. For example, there are greatly increased demands by the military forces for motors used in heavy artillery, rockets, airplanes (one B-29 uses some 90 special motors in the turrets alone and a couple of hundred additional motors throughout the plane).

Generally speaking, WPB believes that there will be motors for all plumbing and heating division uses authorized in 1945 and that materials required for oil burners, stokers, blowers, etc., will be the limiting factor—not motors.

Keep this in mind: Victory can come any day now. When Victory comes, the problems of materials which today look discouraging can change over night. We are not back in 1942 when the whole war lay ahead. Every month now is a big jump to Victory and reconversion. Plan accordingly and courageously.

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION Says

Subscribe Today — Profit Tomorrow

THE various branches of the Warm Air Heating Industry—manufacturers, jobbers, and dealers, located in St. Louis and nearby territory are working on a plan of "Subscription Today for Profits Tomorrow." Mr. C. S. Franke, president of the American Furnace Company and General Chairman for St. Louis of the Subscription Committee of the Association, has held a luncheon meeting of 21 men closely identified with warm air manufacturing, jobbing, and dealer interests in the St. Louis territory. At this meeting, each manufacturer, jobber, and dealer represented, stated, in response to a question by Mr. Franke, that they would do their utmost to influence every manufacturer, jobber, and dealer in the St. Louis area to subscribe to the proposed program. The interests of each one in doing this work was, obviously, for selfish reasons, because the St. Louis group believe that when the proposed advertising and dealer training program becomes effective, it will not only add millions of dollars in sales to the industry, but because of this wider distribution of products and improved installations which are a part of the program, business in the future will be done on a more profitable level than has ever been experienced under peace-time conditions.

Special meetings of jobbers and dealers have been called to obtain a substantial number of additional subscriptions from manufacturers, jobbers, and dealers in this area.

At the St. Louis meetings, special emphasis has been laid on the objectives of the program for the dealers, at the same time emphasizing the objectives for manufacturers, jobbers, and distributors. A brief outline of these benefits which will accrue to dealers follows:

Benefits for Dealers

As a member of the "dealers' division" this is what you get:

1. An educational program covering proper installations, and merchandising and sales promotion.
2. Dealer schools in your town or a nearby town to be conducted by the Dealers' Division of the N. W. A. H. & A. C. Association.
3. Booklets for training and education with manuals, special engineering texts, etc., to help you make a better installation and make more money from it.
4. The benefits of a national advertising campaign directed to the public, the building industry and to the heating industry.
5. Sample newspaper ads tying in with the advertising program; envelope stuffers, display material, poster and card designs, publicity clip sheets—every help to identify *you* as a member of the association and a participant in the national program. This will mean you get personally in your town the advantage of national publicity.
6. Store window emblems of the N. W. A. H. & A. C. Association like the ones appearing in the magazine advertisements. These make it easy for readers who are advised in these ads to "CONSULT WITH THE BUSINESS CONCERN DISPLAYING THIS EMBLEM" to identify you.

The Advertising Program

The association has planned a $200,000 selective program to sell the people who are your prospects and customers and the people who influence them. Typical of the magazines which will make up the schedule are: Better Homes and Gardens, The American Home, Time, Newsweek, Country Gentleman, Sheet Metal Worker, American Artisan, Snips, Fuel Oil and Oil Heat, Coal-Heat, Gas Age, American Builder, and Practical Builder.

Each advertisement will offer free a booklet, "Indoor Comfort Through Conditioned Air," which will be mailed to everyone asking for it. With each booklet sent to your town, will be mailed a letter giving the names of the dealers who are participating in this program. This means prospects for you.

This Is What It Costs:

One or two additional installations which result from prospects developed by the National Advertising Campaign, will pay for the cost of making a subscription.

Subscribe today! Use the attached form.

When you subscribe you also become a member of the Dealers' Division. You don't have to send your check now with the subscription, unless you want to.

Arnold Kruckman's

Washington Letter

What Happens after V-E Day

THIS is written the day the Russians denounced their treaty with Japan. The natural inclination is to assume this means the Russians will soon be fighting the Japanese in Asia. It was Bret Harte who wrote a minor classic about the inscrutable ways of our Chinese ally. By and large, what you may say about the puzzling ways of the Chinese you may also say about other Asiatics. If you have ever done business with the Russians you will bear witness to the fact that, while he has the outer appearance of the European, he has the internal psychology which is more like the Asiatic. There is another old classic among the aphorisms of folklore which suggests there is many a slip twixt the cup and the lip.

Will Russia Fight Japs?

At this moment, a few hours after the denunciation of the Treaty, it would seem as though the Russians might soon be shooting Japs, and that the armies released in Europe might also soon be driving the Japs south in Asia while our armies drive them north, another double play something like the one that is annihilating the Germans. It depends, after all, upon the situation of the Japanese. A smashed Japan would make Russia the boss of Asia. An impaired Japan might have the same effect. What happens in the next month or two will tell whether Russia wishes to base its dominance on complete destruction of the Japanese empire, or on a Japan which must play second fiddle because she is not capable of being the leader. Russia has suffered enormous losses of men and wealth and momentum. Her amazing pre-war progress has been set back. It would be logical Asiatic realism to help in squashing the Japanese with a minimum of expenditure, and yet to wrest out of the adventure the headship of Asia. Apparently whatever Russia may do, it will make our job easier. This writer does not think the Russians have the same intense hatred emotionally for the Japs that they have for the Germans. He visited Japan some years ago, and was amazed to find that the only Occidentals who lived among the Japanese in the back country with the apparently intimate acceptance as though they were Japanese, were the Russians. Your reporter is still of the opinion that the Russians will contribute to the defeat of the Japanese just so much as is needed to give the Russian a dominant place at the sittings where the Japanese hash is eventually settled. This point is important because it has a sharp bearing on everything of interest to your industry as to other American industries.

War, like all other phenomena in human experience, is full of surprises. Everybody concerned may be willing to help the Japanese to take their losses and quit. This reporter does not agree with that point of view. He thinks the people of this country wish to get rid of the Japanese menace, once and for all. The Japanese have never before been licked, and it seems likely they will take much more licking before they "holler uncle." The chances are therefore very strong that the war in Asia will continue for 18 months to 2 years. And it is this prospect which is so important to the business community. David Lawrence is a sober and moderate-minded commentator. He said recently: "There is a popular belief that the war will soon be over. There are some stern disappointments ahead as the people come to realize what the war in the Pacific really means in terms of men and materials. It may not be three months after organized resistance in Germany has collapsed before we will be hearing talk again of man-power shortages and the need for increased production."

Will Control Be Relaxed?

This links up with the puzzle which confronts the observer of business-in-war here in Washington daily. The great majority of business men who come to the Capital seem absolutely convinced that Government controls will be almost wholly removed after V-E Day, that nebulous period in the war calendar everybody talks about and nobody knows how to place. Wherever we meet them here the business people tell us there will be no further interference from Government with their affairs when reconversion sets in. The aspect that makes us marvel in the apparent earnest sincerity with which they hold the belief. We wonder whether this faith in a reversion to the pre-war state of business operation is fostered deliberately somewhere by some agency of which we have no knowledge, or if it is self-hypnotism, wishful thinking.

Government officials are extremely careful to discuss reconversion and its problems publicly, only in the cautious terms which reach you in the newspapers. Their private view goes something like this: generally it is assumed V-E Day will come by June, or at the latest, in July. After V-E Day it is most commonly felt we will have a period of arrested motion which will not be chaos but may be most clearly defined as uncertainty, producing inertia. It is most often thought this period will last for approximately three months. Some of our friends here think it will last

longer, some less. During this period there will be an effort by some of the levels of business to pick up reconversion activities. They will try to prise their way to advantages, for which they should not be blamed. There may come a time when moral values will govern business and politics more powerfully than the realistic tendencies; but that time has not yet been achieved. The same natural tendency will impel workers to drift from jobs that seem done, to jobs that would appear to have more potentialities as permanent parts of the postwar life. But it is thought here that these tendencies will largely be checked by the Armed Forces, and by other government agencies.

It is generally supposed that the Armed Forces will be extremely cautious and very slow about cancelling military orders. Obviously there will be some cutbacks, but the general idea here is that they will be few, scattered, and made in such manner that they will little affect the general war economy during the first three months after V-E Day. The official Army reports suggests 15% to 20% during the first three months, gradually rising to 40% at the end of the first 18 months. Some of the civilian Government war agencies place the cutbacks the first three months at 15% to 20% during the first month or two, and 35% to 40% within 6 months to a year. Those closest to the inner core of the machinery generally feel that the cutbacks will be less than the Army officially suggests, and that the whole system of tapering off to reconversion will be very much slower than you are led to believe by the statements now permitted to ooze out.

Adjustment Will Take Time

It is their opinion, apparently based on sound knowledge of some kind, that the slight contraction during the first three months after V-E Day will be held to the very minimum by the Army in order to keep most war plants at stand-by, and in order to permit them to hold their workers, even if there is virtually nothing for the workers to do. This is thought to be necessary in order that the Army, the Navy, and other agencies may get down to the long deferred business of taking a very long breath and a cool look at the over-all picture of the needs of the great effort that must still be put forth in Asia, plus the job of occupation and pacification in Europe.

There will undoubtedly be adjustments, re-adjustments, re-groupings, and new classifications, with emphasis upon new production. At this time we do not know what additional war material and supplies we must supply to Russia if Russia really gets into the fight in Asia. We may have to help the British and the Australians, and possibly the French, to equip land, naval, and air forces to do their part of the Asiatic campaign. Bear in mind, the war plants idle in part during this three month period will by the terms of their contracts be able to charge the expenses for their idle help and other overhead to the Government.

There seems little doubt in many quarters here that after the V-E Day rest-period is past we will find war production in full blast in many industries and in most war production areas. In addition it is generally assumed there will be a very cautious and slow build-up of the so-called heavy industries for civilian production. This means that in the neighborhood of next October or November you may find the automobile industry starting on the preparations for a more assured and definite production for civilian supply; and it is anticipated there will be a real expansion of the industry to provide the very desperately needed equipment and supplies urgently required by the railroads. Already the ODT has announced it has been given a small amount of metal to permit the building of freight cars. It also is regarded as certain that the electrical equipment industry will be given the go sign, with the same cautious control to prevent a runaway production, and to secure equalization among the plants in all parts of the country. It is desired to avoid the situation which may permit the West to cry that its plants must trail behind the plants in the Mississippi Valley and in the East.

Building To Start Slowly

Construction is expected to start slowly, nevertheless with the assurance that there will be a gradual expansion. Apparently the first construction programs with the relaxation of L-41 will be aimed at larger works, the sort of thing the construction contractor calls the "heavy industries." There will undoubtedly be relaxation of the "M" and "L" Orders which will be reflected in the supply of metals and materials and workers for the plants which make heating equipment, and the various things that are used in connection with heating equipment, or are made as allied products by the industry. We are warned, however, to bear in mind that production in these industries will not be permitted to expand as swiftly as in some others because there is great fear here there may be runaway speculation in farmland, in building property, and in similar holdings, if there is no rigid control. At the same time there is little doubt the heating plant industry with similar industries will be allowed gradually to build up inventories for the great postwar building boom.

Generally speaking, it is expected raw materials, primary tools, and similar fundamental resources will be made available for civilian needs much more swiftly than the modest military cutbacks might indicate. There are many government officials who privately insist that steel, aluminum, and copper will be relieved of allocation control within four to six months after V-E Day. There will be priorities as organized under CMP which will channel the metals into war plants; and suppliers will be able to furnish the unrated orders after the military or war orders have been supplied.

Spot authorizations are to be used to speed the production of civilian goods immediately after the V-E Day resumption. There are many good souls here who honestly and earnestly promise that inventories will be most carefully watched by Government to make absolutely sure that big business does not squeeze out smaller business. However, some of us have our doubts; for instance, we know about an industry which makes a certain type of machinery that provides the inner economy that makes a great service industry operate. This machinery industry has spent much energy and money in successfully preventing the rehabilitation of surplus equipment owned by the Government which would have helped the service industry to operate more easily under the stressful circumstances of the war. The machinery industry presumably was making war equipment. There is some doubt whether most of the industry put all its efforts into war production. The doubt was expressed by its own trade organization. But the presumed devotion to war

(*Continued on page* 132)

"Streamlined" Financial Accounting

By Arthur Roberts

To date in this series we have discussed cost accounting, how to cost estimates from a study of experience figures. But because business is always in a state of flux, we must check up periodically to see whether our estimates actually give the profit shown by the financial accounts. In the November article we told how to make this comparison. In this article we discuss the financial division of accounting.

All contractors keep financial accounts of some sort. If the check book was the only account book, it would be financial accounting of a sort. Many contractors assume that this is the all of accounting. They do not cost operations separately or tie up these recordings with the financial accounts. They assume that as long as they use a double-entry system that their bookwork passes muster. There is much to add to this line of thought.

Years ago, the spindle system was the prevalent method of accounting. Records were spindled on a desk or clipped to a clipboard and all accounts handled in this way. Later on, the single-entry system developed, then the double-entry. But double-entry necessitates a knowledge of debit and credit technique, which is not easy for some laymen to grasp, so they either stick to single-entry, handle double-entry improperly, or have an accountant come in periodically to enter and post transactions, which inflates expenses.

Simplified Double-entry Procedure

The double-entry system has been streamlined to meet this situation. During the past 10 years changes in double-entry procedure have been developed, all designed to simplify it for the benefit of the smaller businessman so that he may handle these details accurately himself at minimum expense, or to aid his bookkeeper to do the work in a shorter time. However, many businessmen who could use the streamlined version advantageously still cling to the old method which requires the use of five main books:

1. The cash journal, in which all cash received and disbursed is entered.
2. The purchase journal, in which all purchases bought on credit are entered.
3. The sales journal, in which all charge sales are entered.
4. The general journal (usually a bound book), in which unusual transactions that cannot be recorded in the other journals are entered.
5. The general ledger, which tells the financial history of a business.

The first four books are called books of original entry. From these books entries are posted to the ledger. Each month a trial balance is taken to assure accuracy. Periodically a profit and loss statement and balance sheets are prepared from the ledger.

The books vary in arrangement to suit business requirements. If a businessman buys and sells for cash his recording is simplified because he does not need a purchase journal or sales journal for charge items. On the other hand, the businessman who sells for cash, on open account, and on time payments may find it desirable to open special books for installment sales where he can record payments as received or keep these accounts segregated for easier computation and reference. In some organizations where many accounts receivable and accounts payable are opened, special ledgers for these recordings are kept in addition to the general ledger. Otherwise, all these records may be kept in the one ledger. In other words, the system is fitted to the business. This is a requisite to managerial efficiency.

Fundamentals Same in All Systems

Quite obviously the big contractors in this industry must use a more complex system than the smaller contractors. All, however, must follow the same fundamentals, building estimates upon experience figures, recording all operations on material requisition slips, time slips, etc., and subsequently comparing estimated results with actual results as shown in the financial accounts. The simplified double-entry system has been designed more for the smaller businessman. The larger organizations still utilize the older and more complex form of financial accounting, although in many cases bookkeeping machines and other improvements have simplified the routine or shortened the time required to record.

At any rate, many streamlined bookkeeping systems are on the market. Some of them do away with the debit and credit terminology rather difficult for the layman to grasp. In some cases only two books are needed instead of five as outlined in the foregoing. One book in this system is a combination journal for all original entries, which are subsequently posted to a ledger. However, the principle of debit and credit is maintained to assure accuracy and to reflect the transfer phase inherent in every business transaction because, obviously, every transaction has two sides.

You always give something for something in every business transaction. Even if you give something away intentionally as a gift or unintentionally through a loss on an estimate, you give your wares and service, taking in exchange the selling price or a reduction in worldly possessions. On the books, this reduction eventually shows up as a reduction in net worth. Regardless of how simplified your accounting system, the books must mirror this give-and-take element in business by means of debit and credit technique. Much of cost accounting, however, is kept on the single-entry plan.

FORMAT FOR PROFIT AND LOSS STATEMENT*

		Total
Sales**		$
Inventory*** beginning of period	$	
Add purchases during period		
Subtotal	$	
Deduct inventory end of period	$	
Cost of goods sold	$	
Cost of labor		
Direct job cost		
Total cost of goods, labor, service	$	
Margin of profit on sales	$	

Overhead Expense

Fixed

Rent or business property taxes	$	
Mortgage interest		
Depreciation on business property and other fixed assets		
Insurance—(Not workmen compensation) (Not public liability)		
Total fixed expense	$	

Variable‡

Owner's compensation	$	
Other salaries		
Office expense		
Truck expense		
Heat, light, power and water		
Repairs and maintenance		
Accounting and legal		
Loss on bad accounts		
Loss on inventory (estimated)		
Advertising		
Commissions and bonuses		
Non-productive labor		
Payroll tax not charged direct		
Workmen compensation not charged direct		
Public liability not charged direct		
Interest on business investment		
Interest on loans		
Miscellaneous		
‡‡Subtotal	$	
Total overhead expense		$
Net profit before income taxes		$
Income taxes for the period (deduct)		$
Spendable profit (What you bank after taxes)		$

Footnotes

**Listings may vary but adhere to this type format. Figures obtained from balances on ledger accounts.*

***Departmentize sales by adding columns—Installations, Service, Over-counter Goods, entering the proper listings under these columns.*

****If inventory not taken, estimate the cost of goods sold based on experience figures, then adjust books with count when taken. Or take the cost from cost records.*

‡Pro-rate to date of statement.

‡‡You get your overhead percentage or labor hour cost for pricing estimates and fixed-price sales from this figure.

This profit and loss sheet provides entries for all the factors that enter into "costs," including the very important item of labor hour cost. It provides the heating contractor with a work sheet that will enable him to calculate the relation of cost to profit. Moreover, it separates fixed and variable overhead, so that the contractor can accurately figure the variable costs in any job. It may be noted also that these variables can be pro-rated to the date of the statement, making it possible to take into account the frequent changes in the costs of labor and materials which prevail today and are likely to prevail in the postwar period. If the contractor will use this format, making whatever changes and additional entries are necessary to fit his individual set-up, he will never be in the dark as to his exact costs. He should be able to figure profit and loss down to the last penny involved. Moreover, the use of this profit and loss statement should aid the contractor to get an overall picture of his financial position, and make filing equitable tax returns an easier task.

Because the contractor cannot run to his books and make recordings as each transaction occurs he uses interim records, such as cash register slips, charge slips, petty cash slips, check book and other media, which keep the data on ice until booked. The wisest procedure is to make entries at the end of each day in the journal, transferring these entries to the ledger daily, weekly, or monthly. Each month take a trial balance of the ledger to see how accurately the work has been done and then prepare a profit and loss statement. Prepare a balance sheet quarterly or semi-annually.

Profit and loss statements and balance sheets follow a standardized form, the former called the operating statement, the latter a financial statement; the former shows sales, cost of sales, margin, overhead and net profit; the latter, assets, liabilities and net worth. Inventory appears on both statements, but no other account need be doubly recorded, although depreciation and net profit are sometimes shown on the balance sheet.

Books are closed in the journals monthly, in the ledger semi-annually or annually. When preparing monthly profit and loss statements it isn't necessary to close the ledger accounts. If adjusting figures are needed to show true monthly profit, they may be entered on the statement temporarily; the ledger need not be disturbed. Regardless of the type of double-entry system used, the form of the profit and loss statement and balance sheet is the same, as is the routine used in preparing them.

Always itemize overhead expense. To get a quick perspective on the movement of operating figures from period to period, use ratios based on sales at 100 per cent. All other figures, being smaller than sales, will be listed as a percentage of sales. This eliminates working with involved dollars-and-cents figures, comparisons of which are not readily perceivable unless ratios are used.

(*Continued on page* 124)

Settling Terminated War Contracts

This is the first of two articles on this important subject by members of the staff of the Office of Contract Settlement. The new work-session contractor training program now available to contractors in various localities throughout the country will be covered in a subsequent article.

By Walter F. Wiener
Public Information Adviser, Office of Contract Settlement

THE subject of terminated war contracts is assuming greater importance in the minds of business men throughout the country. Up to the end of January of this year commitments for war production totalling over 26 billion dollars had been cancelled by contract terminations. Involved were over 130 thousand prime contracts and an even larger number of subcontracts. In the main, these contract terminations to date represented adjustments in the war production program rather than cutbacks.

The remarkable record achieved in war production has been based on the existing business structure. When the Government agencies awarded prime contracts, the prime contractors in turn contracted with subcontractors for parts, components, and materials. Since contracts have been let on this basis, it is generally believed that the same structure should be used in settling the contracts. This makes the lowest tier subcontractors dependent on the contractors in the tiers above them. Thus it becomes obvious that unless all concerned know what to do when a contract is terminated, the process may be seriously delayed.

Past experience has shown that failure of contractors to file their claims promptly has added to the delay of getting the terminated contracts settled. Furthermore, even during a period of intensified war production, it has been found that fast, fair, and final settlement has removed actual and psychological barriers to speeding the materials needed for final victory.

The importance of contract settlement in relation to furthering war production and the readjustment period following victory in Europe was recognized in the Baruch-Hancock Report published over a year ago. The Contract Settlement Act of 1944 passed by Congress, which became effective July 21, 1944, lays the basis for fast, fair, and final settlement of terminated war contracts. The Act established the Office of Contract Settlement as the policy-making agency to unify and expedite the job and to report progress on the over-all picture to Congress four times a year. The Office of Contract Settlement, with Robert H. Hinckley, former Assistant Secretary of Commerce for Air, as Director, was established shortly after the passage of the Act.

The Office of Contract Settlement has issued regulations to meet the needs of the situation as indicated in the Act. It has furthered the establishment of uniform procedures among the contracting agencies and has published two Reports to Congress on the status of contract terminations and settlements.

First Preparations

The first problem that faces the subcontractor today in relationship to contract settlement is how best to prepare himself for termination. Here is a checklist of suggestions:

1. Review your contracts to make sure that they include the Uniform Subcontract Termination Article.

2. Make sure your subcontract is identified as to the prime contract and the contracting agency responsible for the prime contract.

3. Reduce all verbal or informal agreements to writing.

4. Get copies of the Standard Contract Settlement Proposal Forms. These have been prepared by the contracting agencies in cooperation with the Office of Contract Settlement. The identical forms can be used for filing claims with *all* the contracting agencies or higher tier contractors. Copies should be available from the contractor in the tier above you, or from the contracting agency. Additional copies may be obtained without cost by writing to the Readjustment Distribution Center, 6th Floor, Federal Office Building, 90 Church Street, New York 7, N. Y. This office is now the central point for the distribution of all Army, Navy, and Office of Contract Settlement material on termination, and all requests should be addressed to it.

5. Familiarize yourself with the procedure necessary to fill out these forms.

6. Get in touch with the Chairman of the Subcommittee on Training and Information of one of the 21 "Termination Coordination Committees" in your territory and discuss with him or his representative the possibility of having your personnel and your subcontractors' personnel attend the new four-hour training session designed to give contractors a practical knowledge of handling basic termination problems. Smaller War Plants Corporation is establishing a special information service of termination questions.

7. Review your possible financing needs in case of termination with your contracting officer, higher tier sub, banker, or public financial institution, such as the Smaller War Plants Corporation. Interim financing is available to prime and subcontractors through partial payments or termination loans. The procedure for obtaining partial payments and termination loans is fully described in a booklet called "Termination Financing for War Contractors" published by the Office of Contract Settlement. Copies are available

from the Readjustment Distribution Center mentioned above.

8. Familiarize yourself with the Joint Army-Navy Termination Regulation and the regulations of the Office of Contract Settlement. These likewise can be obtained from the Readjustment Distribution Center. If your contracts are with other procurement agencies such as the Maritime Commission, Reconstruction Finance Corporation, or Treasury Department, write to these agencies' headquarters in Washington or their regional offices for their contract termination rules. While the internal procedures of these agencies will differ from those of the Army and the Navy, the work to be done by the contractor in submitting his claim is substantially the same.

9. Know what delegations are available to prime and subcontractors. The present delegations give every contractor the right to settle with his sub where the claim is under $1,000, and where the sub retains or disposes of the inventory. Special delegations to contractors to settle subcontractors' claims of not more than $10,000 may be available on request from the contracting agency. Experience has shown that these delegations are not used to the fullest extent; that the services have been liberal in granting them, and that if they were used settlement could be expedited considerably.

10. Make sure that your accounting system is in good order. It is important to remember that the contractor does not have to have a particular accounting system for war contract termination. The Contract Settlement Act recognizes that a contractor can best prepare his settlement proposal on the basis of an accounting system which suits his general needs, rather than one which meets only the requirements of his contract termination.

The philosophy of contract settlement as embodied in the Contract Settlement Act, the Joint Termination Regulation, the Statement of Cost Principles, and the Termination Cost Memorandums recently issued by the Office of Contract Settlement, emphasizes that the accounting data supporting a settlement proposal should conform to "recognized commercial accounting practices" as distinct from any one method of accounting required in termination.

The Contract Settlement Act is specific on this point in Section 6 (b) which states that the methods and standards for determining fair compensation should be "suitable to the conditions of various war contractors" and may be based on "actual, standard, average, or estimated cost," or on any other equitable basis. This section further states that "to the extent that such methods and standards require accounting, they shall be adapted, so far as practicable, to the accounting systems used by war contractors, if consistent with recognized commercial accounting practice." Thus, the Act lays emphasis on the accounting systems of individual contractors rather than any uniform system of accounts prescribed by the Government.

In the case of a manufacturing concern, a good accounting system would ordinarily include a perpetual inventory control. This embodies a current book record of inventories by major classifications and preferably by individual items. A sound cost accounting system which permits the determination of unit costs of production by products and possibly by departments is desirable. A good accounting system should furthermore provide for the classification of various types of costs and expenses. This would include the allocation of indirect costs and expenses to products on one of many acceptable bases.

It is important to bear in mind that there is no one system of accounting or overhead allocation which suits all needs, but that of the several methods available some may be preferable in particular cases.

11. Check with your Termination Coordination Committee or your contracting officer what pretermination possibilities are available or applicable in your case. Through pretermination it is possible to arrive in advance of termination at definite agreements on such matters as:

(a) Unit cost of raw material and work-in-process
(b) Retention value of inventory items
(c) The items of inventory to be scrapped
(d) Stop-work points or stages
(e) Clearance, storage, and disposition of inventory
(f) Basis of determining profit
(g) Treatment of indirect manufacturing expenses
(h) Treatment of general administrative expenses
(i) Treatment of starting load costs
(j) Treatment of settlement expenses

Pretermination has been found a valuable time-saver and is being pushed to the fullest extent by the Army and Navy and other contracting agencies.

Obviously, it is not possible in a brief article to treat all the intricacies of settling terminated war contracts. It is believed, however, that by doing first things first, by getting the necessary data and applying it to the specific situation of the contractor, much progress can be made. Only by so doing can American businesses, large and small, be prepared for the impact of a greater volume of terminations which are bound to come as our fighting men conquer our enemies in the West and in the East.

Prices of Sections of "Practical Warm Air Heating"

Section No. 1—How to Make a Comfort Survey ..... Price 50c
Section No. 2—How to Check Frame House Construction ..... Price 50c
Section No. 7—Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems ..... Price 50c
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Order with remittance should be sent to:
National Warm Air Heating & Air Conditioning Assn.
145 Public Square, Cleveland 14, Ohio

On Our Industry's Front

Charles Muirhead Advanced in OCR

CHARLES MUIRHEAD, who has been Acting Chief, has been appointed Chief, Plumbing and Heating Branch, Office of Civilian Requirements in WPB. He succeeds Donald Woods, resigned.

Mr. Muirhead was connected with Williams Oil-O-Matic Corporation for 16 years; with the Lennox Furnace Co., Syracuse, for 2½ years. He served on the National Code Authority of NRA and on the Standards Committee for Oil Standards, Bureau of Standards, for domestic oil burners.

◆

Year Round A.C. Demanded

YEAR round air conditioning for their homes is being anticipated and will be bought by many of the millions of readers of Better Homes & Gardens magazine declares a survey recently completed by the magazine at the request of the Indoor Climate Institute. The exact percentage of answers naming year round air conditioning as one of the desires readers expect to satisfy in connection with their homes, was 29.3%.

The Better Homes & Gardens survey of the building, heating and air conditioning buying intentions and desires of its readers also revealed that 53.9% of their readers will spend $6,000 or more for their postwar home, based on the study of a typical group. Half the families propose to buy air conditioning—year round, or for summer cooling, or for cooling only certain rooms.

Nine out of ten families want automatic heat. Over half, 52% want warm air heat. Over a quarter, 25.5% want hot water heat. Preference for steam heat was 6.2% and for vapor heat, 3.6%.

When the question of kinds of fuel they would use for heating purposes was asked, 39.6% said they would use oil, 37.5% answered they would use gas, 19.6% replied that they would use coal. Only 9.8% said they would use electricity for heating purposes.

The survey showed also that in remodeling existing homes more people plan to install new heating, than insulate and get along with present heating.

When questioned as to which rooms of their homes they will cool, over three-quarters of the families, 78.3%, specified bedrooms. Next in cooled room preference came living rooms, with 43.5% and finally kitchens, with 30.5%.

◆

Draft Pool Dwindles

UNLESS European phases of the war end quickly, draft boards are going to have to dig still deeper into the 4,000,000 men who now hold industrial deferments, observes National Chamber of Commerce.

And that means that business and industry will have to take another long look at their labor supply situation.

Occupational deferments began to receive careful study late last year after the German break-through in the Ardennes Forest. The proof lies in the fact that industrial deferments—classes 2-A and 2-B—declined 8,000 in November, 58,000 in December and 172,000 in January, cutting the pools to 4,026,000 men.

There are two other major groups from which draftees might come if there were to be major changes in present policy. One is the 3,531,000 men in 4-F. The other is the 1,407,000 total deferred in agriculture.

Major-General Lewis B. Hershey, Selective Service Director, states the situation frankly when he says that the people from whom both fighters and workers must be drawn are diminishing and the "problem of selection (becomes) increasingly difficult." He says:

It has been constantly emphasized that the calls of the armed forces must be filled. It also has been repeatedly stated that the armed forces desire young men for combat replacements in so far as they can be made available. If the calls can be filled with young men, as desired, while at the same time observing the provisions of the Tydings amendment for those in agriculture and recognizing the vital requirements of key men in industry, it should be done.

Men over 30 will be taken in increasing numbers, however, as those in the age group 18 through 29 become less sufficient to supply the needs of the armed forces. This means that a substantial portion of future calls will consist of the older aged registrants. That is the record of history.

It seems evident that the draft quotas will be filled. But that means that industry and perhaps agriculture, too, will have to yield men sorely needed for production at home.

◆

Less Steel in Warehouses

SOME tightening of controls over the sale of steel from warehouse stocks may be expected, in the face of expanding war demands, members of the General Steel Warehouse Industry Advisory Committee were told by War Production Board officials at a recent meeting.

WPB approval has already been temporarily suspended on warehouse sales of critical steel products on an "ex-allotment" basis, under Direction 44 to Controlled Materials Plan Regulation No. 1.

A sizable increase in warehouse steel inventories, which had been built up in the fourth quarter of 1944, has largely melted away during the last six weeks as a result of heavy war orders, according to J. R. Stuart, chief of the Steel Division Warehouse Branch. He also said that warehouse inventories have been depleted by rail embargoes and by the fact that purchasers had not allowed sufficient lead time when placing mill orders with consequent greater demand on warehouse stocks.

◆

New Gas Lines

AN A-1 priority rating has been authorized for two additional natural gas pipeline projects primarily designed to increase deliveries of gas from the Southwest into the Appalachian area by next winter.

One project involves the addition of four compres-

(*Continued on page* 119)

Organizing for Post-war Business

By Charles R. Bennett*

ORGANIZING for post-war business requires a *new attitude*. Instead of waiting for business to come to us, as has happened during the war, we will have to organize on a basis of *going out after it*. Even before the war, many furnace dealers *waited* for the business instead of going out after the business aggressively.

Other industries are organizing to go after business. Large rubber and oil companies are going to sell heating and appliances from super service stations, in addition to rubber tires, oil and gasoline; and they are going to service these heating products and appliances from beautiful display rooms and service shops. These and other large companies are going after the business in an organized way. They are planning to spend millions in advertising, sales promotion and on trained sales forces. You can bet that the refrigerator, the radio, the automobile, the washing machine, the electric appliance, the real estate and other wide awake people in American industries are organizing and laying plans for post-war business. They are not going to wait for it to come to them.

Manpower will come back from the wars. All this manpower cannot and will not go into manufacturing products. Only about 25% of our total manpower will be used in *making* things in factories and about 25% will be employed on farms. This leaves about 50% to be absorbed in the service industries as salesmen, service mechanics, professional men, etc. We must be alert and organize now to hire, train, direct, stimulate and pay this manpower as salesmen in order to get our just share of the tremendous business available after the war.

Organize to Sell

The average home owner waits for his heating plant to give him trouble before he calls in a heating man. We must go to the home owner and *reveal the need* for annual check-ups on his heating plant and other appliances. This can be done by newspaper and direct mail advertising, but most effectively by a house-to-house canvass, two or three times a year. People must be shown. Reasonable offers must be made for cleaning, repairing and "re-cementing" his present furnace. These services then must be rendered without a "racket" motive behind them. The customer's interests must be kept in mind at all times. We will then build a tremendous volume of new furnace, oil burner, stoker and air conditioning business; and when furnaces are *revealed to need* major repairs our industry will sell modern automatic heating. If we don't go after business aggressively, the oil burner and stoker distributors and other merchandisers will make big inroads into our heating market. The best defense is the good offense.

We Must Get 10% Gross Profit

In our post-war set-up, we are going to set a minimum of 10% profit as our goal; and to realize this net profit we must have an adequate gross profit on each line of products we sell, as follows.

1. 100% mark-up on furnaces, automatic heating and fittings.
2. 50% mark-up on stoves, heaters, ranges and other appliances.

A budget of our business can be estimated at several sales volumes per year, but to be specific let us take $100,000.00 per year as a goal, to-wit:

1. 100% mark-up or a 50% gross profit.		
a. Heating Sales.....		$ 60,000.00
(1) Selling expense at 15%	$ 9,000.00	
(2) Installation expense at 15%	9,000.00	
2. 50% mark-up or 33⅓% gross profit.		
a. Appliance Sales		40,000.00
(1) Selling expense at 10%	4,000.00	
(2) Installation expense at 3%	1,200.00	
3. Overhead @ 10%.....	10,000.00	
TOTAL EXPENSES	$33,200.00	
4. Cost of Heating Merchandise	30,000.00	
5. Cost of Appliance Merchandise	26,800.00	
TOTALS	$90,000.00	$100,000.00
NET PROFIT		$ 10,000.00

Sales Must Come First

Our industry (as outlined several times in this magazine) is making three big strides after the post-war market:

1. $200,000.00 advertising campaign.
2. Manufacturer, Distributor and Dealer Warm Air Association.
3. Training courses for salesmen, installers and service men.

But in organizing for post-war business we must bear in mind that *sales must come first*. We all know that well-designed and well-engineered products are important; that good installations are necessary; that patient, thorough service builds business. But without *sales* we cannot do a thing about installing, servicing or manufacturing heating products. Therefore, we must always keep in mind that *sales come first with every heating dealer*. Then the rest of a well-organized

(*Continued on page* 131)

**Editor's Note—C. R. Bennett has been with Chicago WPB for the past two years but for 10 years was Assistant Sales Manager for Holland Furnace Co.; for 5 years Vice-president and Sales Manager for the Landwehr Heating Corp., Philadelphia; for 3 years a branch store manager with Kalamazoo Stove and Furnace Co.*

Interpretations, Amendments, Easements To Existing Orders

M-126 Amended

THE War Production Board announces that Order M-126 has been amended to bring it in line with other WPB regulations and changes. Other orders and regulations have been issued, which adequately control the use of iron and steel in a number of products and, accordingly, reference to 86 such products has been deleted from M-126.

The order states that iron and steel for maintenance, repair and operating supplies for products prohibited under the order may be used only to replace parts of a product if the parts are to be used for maintenance and repair of such a product. The manufacture of a complete product that has been prohibited under the order is not permitted through the use of MRO.

The appeals clause has also been modified to correspond with the provisions of Priorities Regulation No. 25 (the spot authorization plan).

Of interest to our industry: gutters and conductors and fittings for one story houses are still prohibited but may be repaired; marquees are prohibited; dust collecting systems are prohibited except on approved orders; attic fans are prohibited; gas conversion burners and small steel boilers are prohibited; starter shingle strips are prohibited; most tanks are prohibited; termite shields are prohibited; most restaurant equipment is prohibited except on rated orders; most farm goods are prohibited. Registers and grilles formerly under M-126 have been removed and are now controlled by limitation orders.

◆

WPB-541 Simplified

IN a move to save paper as well as to simplify the processing of priority applications, the War Production Board has "streamlined" Form WPB-541, the general purpose application form for priority assistance. The new form comprises two pages instead of four as previously.

This application blank, which is used whenever a special priorities form is not prescribed by an order or regulation, is one of the most widely used in WPB. Formerly known as PD-1A, this form is used in the majority of cases by anybody who does not have a priority rating and needs one. For many months these applications have been flowing into WPB field offices for processing at the rate of nearly 3,000 per day.

Since the form must be filled out in triplicate, approximately a quarter of a million copies per month are being used. By cutting the size of the form 50 per cent, enormous savings will be effected in paper consumption, printing, transportation, storage space, and processing time. In addition, the simplified version will save applicants time and effort.

With the new style form, WPB will initiate the policy of keeping the original application and returning a duplicate for the applicant's records. Although the new forms have been distributed to all field offices, no definite cut-off day for the old form has been set. For the present WPB offices will continue to accept and process applications on the old forms.

◆

Evaporative Coolers

MANUFACTURERS of evaporative coolers are eligible for individual price increases if they fulfill the requirements under which such increases may be granted, says OPA. Evaporative coolers are included under household air conditioning equipment and are covered by the general consumers durable goods regulation, Maximum Price Regulation No. 188.

Production of the coolers has been permitted in certain western states where they are needed by war workers. A shortage of coolers existed in these areas because none had been produced since August 1942. This action is expected to result in an increased supply through adjustment of the maximum prices manufacturers are permitted to charge.

(Amendment No. 51 to Maximum Price Regulation No. 188—Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Durable Goods Other than Apparel—effective March 28, 1945.)

◆

More No. 1 Labor Areas

EXPENDED production schedules and the continuing withdrawal of male workers for the armed forces have necessitated the shift of nine areas into Group 1 in the War Manpower Commission's revised labor market area classifications effective March 20.

Additions to the Group 1 list, all from Group 2, are: Anderson, Ind.; DeKalb, Ill.; Grand Rapids, Mich.; Indianapolis, Ind.; Jackson, Mich.; Perth Amboy, N. J.; Peoria, Ill.; Toledo, Ohio, and Youngstown, Ohio. In all of the areas there are plants on the "must" list where production is lagging. To date all efforts to recruit manpower sufficient to meet their needs have failed, WMC said.

In five areas, previously classified as Group 1, production adjustments, including cutbacks, required their reclassification into Group 2. They are Meriden, Conn.; Pascagoula, Miss.; Racine, Wis.; Savannah, Ga., and Ventura-Oxnard, Calif.

The next WMC area classification will be announced May 1.

◆

Roofing Simplification

FURTHER standardization and simplification of asphalt and tarred roofing products have been established to conserve the supply of dry felt used in making these products and to increase production of types needed for heavy overseas requirements and to meet shortages of other roofing materials, such as metal and wood shingles.

(*Conitnued on page* 117)

AMERICAN ARTISAN

SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Get In Touch With

Waterbury

For A Reliable Post-war Connection

We say to you in all earnestness—"Get In Touch With Waterbury For A Reliable Post-War Connection."

We believe there are important reasons why you should so safeguard your future supply:

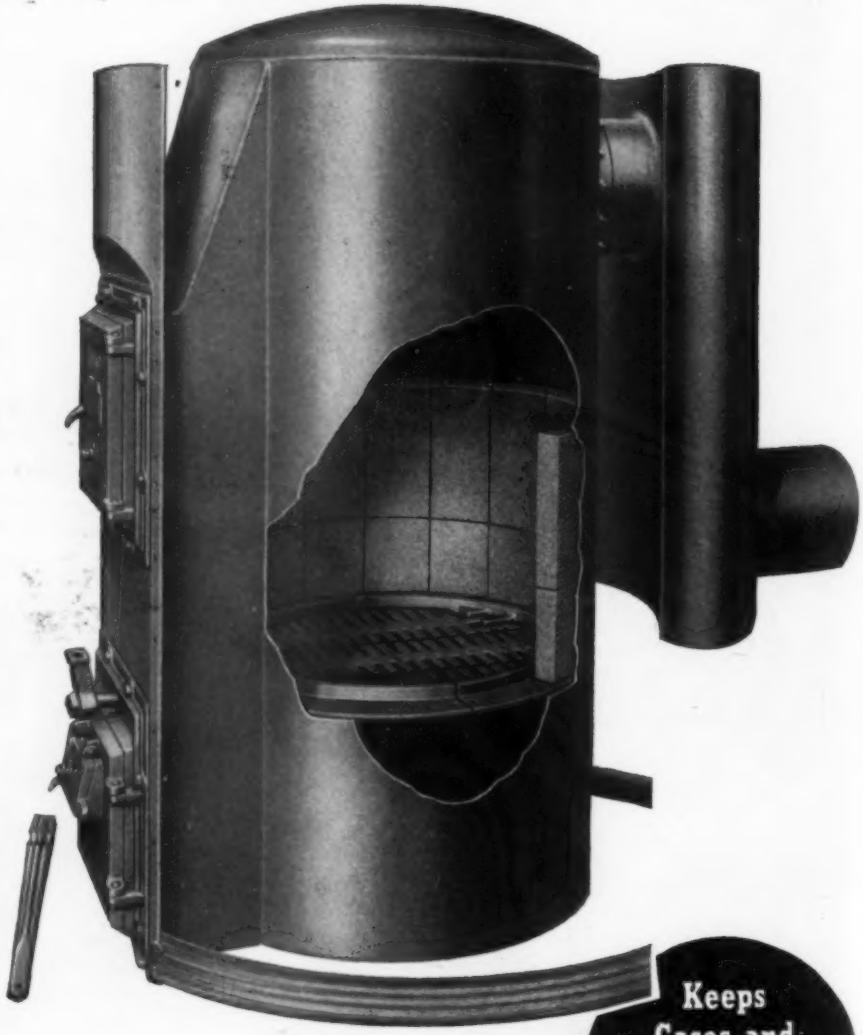
1. The immediate post-war demand will be so great that we shall have to apportion at least our early 1946 production among established customers almost as rigidly as we do now.

2. There will be no accumulated stocks to draw upon.

   We regret that we cannot accept any more orders from new accounts for 1945 shipment.

We are doing our best to take care of our established trade — but the war comes first — and until that job is done, our best will have to be good enough. In any event, every Waterbury Furnace that is shipped will be of a quality that creates good will and future sales.

So, we urge that the prudent thing for distributors and retailers is to "Get In Touch With Waterbury." — plan now for a reliable source of supply in 1946.



THE *GASTITE* FURNACE
MODERATE IN PRICE
HIGH IN QUALITY

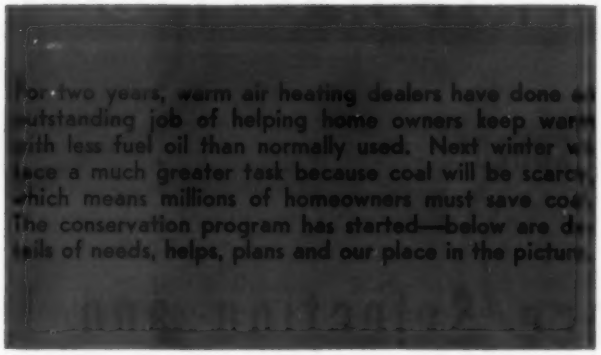
Keeps Gases and Dust Out of the Heat Stream

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E., Minneapolis, Minn.

Beginning in April there will be a

1945 Fuel Conservation Program


For two years, warm air heating dealers have done
outstanding job of helping home owners keep war
with less fuel oil than normally used. Next winter w
face a much greater task because coal will be scarc
which means millions of homeowners must save co
The conservation program has started—below are d
tails of needs, helps, plans and our place in the pictur

NEXT winter—unless miracles happen to coal production and transportation—American home owners will have for house heating some 20 to 30 million tons of coal less than used this past winter.

So domestic coal users will be rationed. The rationing basis has been determined, and "Consumer Declarations" will be ready for home owners to fill out within a few weeks. These "Declarations" are explained elsewhere in this issue.

Howeowners will get, next winter, only 80 per cent of the coal they used last winter. Coupons will not be issued—instead coal dealers will get 80 per cent of their last year's coal receipts and will, then, try to do the best they can to spread coal among their customers.

Conservation Program

Office of War Information will announce in April an extensive publicity program to conserve fuel. The program to conserve fuel will this year be under the jurisdiction of the Bureau of Mines. Full details have not been completed, but at this time the campaign shapes up as follows:

March—By radio and in newspapers a campaign urging homeowners to "shut down fires early" and stop fires every possible day to save fuel for next winter.

April—By radio and in 500 shopping newspapers an explanation of the "why" and "how" of the fuel "declaration." Fuel producers will use their advertising space to tell about the need for conservation.

May—A new "Prepare for Winter" campaign will begin and continue until next October. National radio chains will "spot announce" fuel conservation. Radio programs will also explain "why" and "how" as they did last summer. About June, a short movie will be offered theaters. OWI will have ready a "mat" service with typical advertisements to be purchased by local merchants. Newspapers will sell these ads and will make up editorial articles for building pages, commerce pages, etc. There is planned several hundred thousand car cards and display posters business firms can use.

Time Finance Plan

The Federal Housing Administration has announced for the third year a "Summer Plan" for insured financing of installations to conserve fuel through prevention of heat losses. Under this FHA plan, the first payment on loans made during the Spring and Summer may be deferred until November 1.

To qualify for one of these loans, the applicant must guarantee that the entire proceeds of the loan will be used to buy and install storm sash, insulation, weather stripping, control equipment, etc. Under Title 1, loans may be made for this purpose up to $2,500 and will be repayable in monthly installments over as long as 36 months. Generally, installations of this type may be made without authorization of WPB.

On heating equipment the following are classed as fuel conservation measures: conversion of heating plants to the use of any other fuel; the repair of heating equipment; the replacement of heating equipment which is worn out, damaged or destroyed. Blowers may not be added as a fuel conservation measure, but controls are so classified.

Controls

The Fuel Conservation Council for War, Automatic Controls Industry, has been working for weeks tabulating the number of thermostats, damper motor sets, limit controls, fan controls, barometric dampers, etc. needed to save 20 to 30 million tons of coal. WPB probably will accept these recommendations because coal conservation is a "must."

But control manufacturers, like all other durable goods producers, had their materials cut for the second quarter. Their first need, then, is to get these materials reinstated. Second, to get more materials for increased production in the third quarter. Third, before manufacturers can produce controls they need manpower. If all these needs are met—we will have controls to conserve coal.

Contractors will want to help this program along, but contractors, like the manufacturers, are in great need for manpower. It does not seem at this time there is much hope for help from Washington on manpower. We are an "essential" industry, but most manpower today is being directed into "critical" industries. Last summer, many contractors conducted sales campaigns on controls—some contractors sold several hundred sets. Probably we can do equally well this year—it will be a contribution to the war effort.

As the campaign unfolds, additional information will be published.

The "How, What and Why" of the New Winter Air Conditioning Manual

BY
S. KONZO*

HOW TO USE IT
WHAT RESEARCH BACKS IT UP
WHY EVERYBODY SHOULD ADOPT IT

Furnace Selection and Rating

THE new CODE AND MANUAL FOR THE DESIGN AND INSTALLATION OF WINTER AIR CONDITIONING SYSTEMS is more than a method of design of a heating plant. Where more than one term is used in industry to describe a given use, the manual sets up a standard terminology so that it serves a dictionary for the industry. In the case of manufacturers' catalogs, where many different arrangements of the catalog data are in use, the manual suggests the pertinent information that should be included. In many ways, the manual is a standard for the industry.

Even in such a relatively simple matter as furnace ratings and furnace selection, we have set up a few simple definitions that will be a pattern for all furnace manufacturers' catalogs. An excerpt from Section B of the new manual is shown in Fig. 3. The material is self-explanatory, but a few items can be emphasized.

a) As was explained in the first two issues of this series, the heat losses from a building are to be determined in terms of Btu per hour. This single item is all that is required of a dealer when he selects a furnace for a given building. All furnace ratings expressed in terms of "square inches of leader pipe" will be dropped by the industry as soon as possible. In spite of years of explanation and discussion, we have found it practically impossible to get across the complete story of leader pipe ratings. Ratings in terms of leader pipe area should never have been used in the first place. The industry should discard the term now and should use in its place the one universal index of rating, namely, Btu per hour, which will be understood by any heating man regardless of what type of heating system he is handling.

b) In manufacturers' catalogs many terms have been used in the past for stating the rating of a furnace. Some of these terms are: bonnet capacity, bonnet output, furnace output, furnace capacity, heat input, output rating, heat delivery, etc. Unfortunately, this extensive terminology has resulted in many misunderstandings, so that in some cases a dealer has never been quite sure whether the ratings of two different furnaces were on a comparable basis.

The standard approach that is suggested in the manual is to use only two terms, namely, *bonnet capacity* and *register delivery*. The *bonnet capacity* is the Btu per hour available in the air at the outlet of the furnace bonnet. The *register delivery* is the Btu per hour available in the air appearing at the warm air registers.

It will be to the advantage of each furnace manufacturer to see that his catalogs are in conformity with this standard terminology. These two terms of bonnet capacity and register delivery will be used for both gravity and forced-air furnace applications.

c) The table for selection of a furnace (Table 4 in the manual) is simple to use. The values for total heat loss from a building are shown in the first column, in increments of 10,000 Btu per hour. The required minimum register deliveries and bonnet capacities are shown in the second and third columns.

Some have raised the question as to why the table includes heat loss values as low as 20,000 Btu per hour, and extends only to a value of 150,000 Btu per hour. The lower value of 20,000 Btu per hour heat loss may be encountered in cases where furnace-blower units are used to heat small apartments. For example, the closet-type gas furnace has been widely used in the case of small, three and four room apartments that have very low heat losses.

The upper limit of 150,000 Btu per hour heat loss was arbitrarily selected by the Code Committee. The greatest need for the new manual is in the field of small homes, for which the heat losses are usually less than 150,000 Btu per hour. In the case of large buildings, and particularly non-residential buildings, some doubt was expressed as to whether the manual would be able to take care of the special needs that were sometimes encountered. For example, the manual design procedure is based on the availability of a certain pressure (static pressure of 0.20 inch) at the furnace bonnet and blower inlet. In the case of commercial or large residential structures, the designer may want to use considerably higher pressures than are included in the manual. At the present time the design tables have not been prepared to handle these larger pressure requirements. In general, however, if the installation is a conventional one and the pressure requirements are not abnormal, the manual can be extended to cover the cases in which the heat losses are in excess of 150,000 Btu per hour.

Special Research Professor, Engineering Experiment Station, University of Illinois.

TABLE B
Test Codes for Forced-Air Furnaces

Fuel	Code	Sponsored by	Laboratory Tests to Be Made by	Allowable Temp. Rise Through Furnace	External Static Press (In. water)	Minimum Efficiency Allowable
Gas-fired	American Standard Approved Requirements for Central Heating Gas Appliances	American Standards Ass'n.	American Gas Ass'n. or Approved Laboratory	70-100° F.	0.20 in.	75%
Oil-fired	*Tentative Code for Testing, Oil-fired, Fan-Furnace Units; 6th edition	National Warm Air Heating and Air Conditioning Ass'n.	Manufacturer or Approved Laboratory	89-91° F.	0.12 in. for 0-800 cfm. 0.20 in. for 800-1600 cfm.	70%
Vaporizing Oil	Warm Air Furnaces Equipped with Vaporizing Pot-Type Burners	National Bureau of Standards CS-104-43	Manufacturer or Approved Laboratory	89-100° F.	Same as above for oil-fired units	72%
Coal, Hand-fired	Solid-Fuel Burning Forced-Air Furnaces (Bonnet capacities up to 80,000 Btu per hour)	National Bureau of Standards CS-109-44	Manufacturer or Approved Laboratory	70-100° F.	0.20 in.	55%

**The provisions of this code are under study. It is probable that the requirements will later be changed to make it conform to CS-109-44 described under "Coal, hand-fired" units. The latter code was developed by cooperation between our national association, the Bureau of Standards, and the research staff at the University of Illinois, and is now effective.*

d) When a furnace is tested in a laboratory in accordance with one of the several test codes, the bonnet capacity is the value that is determined from the test data. In a piped duct installation, a heat loss occurs between the bonnet and the registers, so that the register delivery is smaller than the bonnet capacity. This register delivery is obtained by calculation and in the case of the manual is assumed to be 15 per cent less than the bonnet capacity in a forced system. (In a gravity system the register delivery is assumed to be 25 per cent less than the bonnet capacity.)

In selecting a furnace for a given house, this register delivery is made at least equal to the calculated heat loss from the structure.

NOTE: The following section is of interest only to the advanced student, who wants more of the background than the preceding explanation offers. This material is offered as a reference source, particularly for the students of the textbook series of the Association.

Furnace Rating Methods

At the present time there are in use, or in a formative stage, several test codes dealing with the testing and rating of forced warm-air furnaces, as shown in the accompanying Table B. Some slight discrepancies exist between the requirements of the several codes, but the trend in general is quite marked towards a maximum allowable temperature rise through the furnace of 100 deg. F., an external static pressure requirement of 0.20 inch of water, and a requirement that all ratings be determined from actual laboratory tests of the furnace equipment.

The entire heating industry, including those producing boilers, stoves, floor furnaces, and space heaters, has swung over to actual testing of equipment, and the warm-air industry is no exception. These performance tests add a burden to the manufacturer, but the end result of obtaining better built furnaces justifies the added cost and trouble.

New Rating Equations (Coal-Fired)

At the present time, the following three classes of furnace equipment are not specifically covered by test and rating codes:

1) Hand-fired furnaces having bonnet capacities in excess of 80,000 Btu per hour. (The test provisions given in CS-109-44 mentioned in Table B could be readily extended to include these larger furnaces.)
2) Hand-fired furnaces converted to stoker, oil, or gas firing.
3) Stoker-fired furnaces.

It is probable that eventually all warm-air furnaces will be tested under specified laboratory conditions and the ratings determined from the test results. Tests of coal-fired furnaces are not simple to make and they require considerable time and money on the part of the manufacturer. Nevertheless, the demands imposed by competition, financing agencies and consumers, as well as dealers, will inevitably result in ratings determined from actual performance tests.

In the meantime, when no test codes are available for this type of fuel-burning equipment, the industry cannot afford to ignore their existence. Neither can industry permit each and every manufacturer to select arbitrarily ratings based on expected performance. To a certain extent, this situation prevailed in the prewar period, with the result that the more conservative manufacturers were being unfairly penalized by the more optimistic ratings of some competitor.

The Research and Codes Committees of the Association have adopted the suggestions offered by the Research Staff in December, 1944, with the result that the Association is now solidly behind the new furnace rating formula, or equation, for hand-fired furnaces. Members of the Association have been notified of the new equations. Space does not permit a complete discussion of the background of the new rating equations, so that only a short summary of the main points will be given. Briefly, three equations are of interest

Section B

1. SELECTION OF FURNACE SIZE

The TOTAL HEAT LOSS FROM THE STRUCTURE, as expressed in terms of TOTAL B. T. U. PER HOUR, provides the information needed to select the furnace size from a manufacturer's catalogue.

Furnaces for warm-air heating systems are RATED in terms of B. T. U. PER HOUR, based either on:

a. REGISTER DELIVERY, or

b. BONNET CAPACITY.

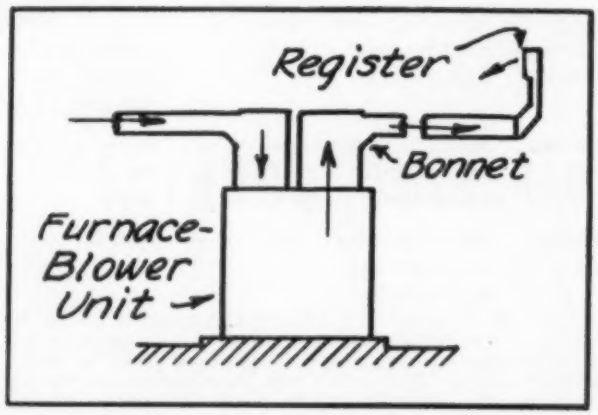


Fig. 3

FURNACE RATINGS IN TERMS OF REGISTER DELIVERY OR BONNET CAPACITY

SELECT A FURNACE WHICH HAS A REGISTER DELIVERY RATING, OR A BONNET CAPACITY RATING, WHICH IS EQUAL TO, OR GREATER THAN, THOSE LISTED IN TABLE 4 OPPOSITE THE TOTAL B. T. U. HEAT LOSS.

EXAMPLE: Total B. t. u. Loss = 100,000 B. t. u. per hr.
Select a furnace having a minimum register delivery of 100,000 B. t. u. per. hr., or a minimum bonnet capacity of 118,000 B. t. u. per hr.

for forced-air furnaces.

1) Hand-fired, coal furnace for bonnet capacities in excess of 80,000 Btu per hour, and with ratios of heating surface to grate area of less than 25 to 1. $\text{Register Delivery} = 2265\ S$
2) Same, except for ratios of heating surface to grate area over 25 to 1. $\text{Register Delivery} = 2265 \times 25 \times G$
3) Hand-fired, coal burning furnaces converted to stoker, gas, or oil firing. $\text{Register Delivery} = 2265\ S$

in which:

Register delivery is in terms of Btu per hour.

S is the area of the heating surface in square feet.

G is the area of the grate in square feet.

These three equations are new and are based on the best available data from a large number of tests of conventional types of furnaces. Admittedly, any rating determined from the above equations is not as reliable as a rating determined from actual tests of the given furnace. These equations, however, have a rational basis for their derivation and are sounder than any of the equations that have been commonly used by industry in the years past. A complete discussion of the derivation of these rating equations will be presented in a University of Illinois circular now under preparation and which will be released by next winter.

Rating of Gas-Fired Furnaces

The gas industry has long recognized the advantages of having each furnace model tested in a central laboratory and of having a uniform method of rating the units. As a matter of fact, at this writing, the only furnace-blower units that will completely satisfy the manual requirements for temperature rise and available static pressure are gas-fired units bearing the seal of the A. G. A. Laboratories.

In the case of gas-fired units the rating label that describes the capacities of the unit shows two items as follows:

1) Hourly Btu input rating. (This value is used by the installer to properly adjust the rate of gas flow to the unit.)
2) Output rating in Btu per hour. (This is a value corresponding to our recommended term of bonnet capacity.)

We have been cooperating with the Certified Performance Committee of the American Gas Association in a common desire to arrive at a uniform terminology. The term for register delivery is not shown on the rating labels of the gas-fired units, so that in the selection of a gas-fired furnace for a given house, it is necessary to use the values shown in the third column of Table 4 in the manual.

During the early stages of our conference, the method advocated by the *Gasco Guide*, issued by an eastern gas utility company, was considered for inclusion in the new manual. In the *Gasco Guide*, a table

Table 4

TABLE FOR SELECTION OF FURNACE SIZE

Total B. t. u. Heat Loss,* in B. t. u. per hour.	Minimum Register Delivery, in B. t. u. per hour.	Minimum Bonnet Capacity,** in B. t. u. per hour.
20,000	20,000	24,000
30,000	30,000	35,000
40,000	40,000	47,000
50,000	50,000	59,000
60,000	60,000	71,000
70,000	70,000	82,000
80,000	80,000	94,000
90,000	90,000	106,000
100,000	100,000	118,000
110,000	110,000	129,000
120,000	120,000	141,000
130,000	130,000	153,000
140,000	140,000	165,000
150,000	150,000	177,000

* For intermittently heated structures, such as churches, which may be heated only one or two days out of the week, see Note No. 13 in the first part of Section A of this Manual.

** A reserve capacity of 15 per cent for piping loss has been assumed. Do not confuse the term "bonnet capacity" with the term "heat input". The latter term is frequently stated in manufacturer's catalogue data together with terms of register delivery or bonnet capacity.

was shown in which a difference in capacity requirements was indicated for an insulated house, as compared with an uninsulated house having the same hourly Btu heat loss. The table showed, for example, that an insulated house having, say, 100,000 Btu per hour heat loss required a relatively larger furnace than an uninsulated house having the same heat loss. The complications introduced by trying to segregate houses into two general groups seemed hardly worth while, since the difference in the required capacities of the furnaces was only a few per cent. Furthermore, the manual method of calculating heat losses is conservative in the case of insulated houses, so that the manual automatically accomplishes in one table for furnace selection, that which was shown in two tables of the *Gasco Guide*. At any rate, at the present time the A. G. A. subcommittee has tentatively accepted the table of furnace selection and further deliberations are planned.

Duct Transmission Efficiency

If 100 Btu per hour left the bonnet and 85 Btu per hour appeared at the warm-air registers, the duct transmission efficiency is equal to 85 per cent. In other words, 15 per cent would be assumed as heat loss from the ducts. In preparing Table 4 these values were assumed. That is, the register delivery is equal to 85 per cent of the bonnet capacity.

Observations made in the Research Residence have indicated that actually the duct transmission efficiency may be considerably lower than 85 per cent. We also know that the duct transmission efficiency depends to a large extent on the average length of the warm air runs, the temperature of the basement, and the size of the warm air ducts. In an installation having long warm air runs we would expect a lower transmission efficiency than in the case of a house having short warm air runs. Theoretically, therefore, if the heat loss from the ducts were not partly regained by the house, we would be confronted with the necessity of assuming varying values of this transmission efficiency for each installation. Actually, this refinement is not considered necessary, since a large part of the heat loss from the ducts is usefully used in heating the living quarters, either through the basement ceiling or through the walls carrying the heat ducts. In ordinary residential applications for which the heat loss is of the order of 150,000 Btu per hour or less, the assumption that 85 per cent of the heat at the bonnet is usefully used in offsetting the heat loss from the house is a reasonable one.

Special Furnace Installation

The question has been raised as to whether the value for bonnet capacity, instead of register delivery, should be used in selecting a furnace for a basementless house in which the furnace is located on the first floor. For this type of application, any heat loss from the casing or ducts is immediately transferred to the living quarters, and the heat loss from the ducts cannot be considered a true loss.

Theoretically, a dealer would be justified in the case of a basementless house in selecting a furnace whose bonnet capacity, and not register delivery, is equal to the heat loss from the house. To do so, however, leaves no margin of safety for any pick-up demand. After a night setback in temperature such a plant will be slow to respond in the morning. In other words, we do not consider it desirable to figure so closely that not even a 15 per cent margin of safety is provided. Hence, our recommendation would be to use the same procedure in selecting a furnace for a

(*Continued on page* 128)

Essentials of Oil Burner Service

Part III

Good and bad thermostat locations—How to adjust thermostat—What is "Cold 70"—Types of accelerator thermostats and how to adjust—Causes of too-frequent cycling and overheating.

By E. F. Fuller—E. F. Fuller Engineering Co.—Oconomowoc, Wisc.

THE thermostat is the control which regulates room or building temperature and controls the body comfort of the occupants. The placing of the thermostat in a building is of the utmost importance; usually the living room or dining room inside wall is the most suitable location for the thermostat.

One should avoid locations where the thermostat may be affected by drafts, warm air ducts, steam or hot water pipes, heat from the fireplace, or direct sunlight. We live in the four-foot zone, so in most cases the thermostat should not be over four feet from the floor level.

Thermostat Adjustments

Customarily, the thermostat is adjusted at the factory and all that is necessary after installation is to set the "indicator" at the desired room temperature. The difference between on and off is usually set at factory from 1½ to 3 degrees; however, many thermostats have adjustments which may be increased or decreased in the field, in accordance with manufacturer's bulletins.

Diagram 8 shows the method of adjustment of the frequency differential setting for "on" and "off" used by one manufacturer. Each thermostat of this type is provided with a frequency adjustment by which the *length* of burner operation period can be regulated. This adjustment is made by moving the internal frequency indicator to the desired position on the calibrated scale indicated by letters a-b-c-d-e at a = 10 minutes; b = 10 to 20; c = 15 to 30, with ¾ degree rise in room temperature; d = 15 to 30 minutes with 1¾ degree rise in room temperature; e = same as for non-heater element thermostats, with mechanical differential of 2¾ degrees.

Diagram 9, Part 7, shows another type thermostat having a differential dial with figures from 1-5 marked on the outer edge. The "on" period will be increased by turning the differential dial connected to the white circuit, counter clockwise, or placing one of the higher numerals opposite the indicator pointer, and may be shortened by turning the dial clockwise, at the rate of about ½ division per degree temperature difference.

"Lag," "Cold 70," "Over-ride"

Between firing periods, the heater and combustion chamber cool down. When the burner starts again, this cooling action continues until the heater is warmed and heat is delivered into the building. This period is called the "lag," or "Cold 70," and depends upon the thermostat differential setting and the type of heater. After the burner stops, the heat continues to flow into the building and the temperature rises above the thermostat setting. This period is called the "override."

Accelerator Thermostats

Some thermostats are equipped with three wires, completing two low voltage circuits, operated by two contact points. One circuit closes first, starting the burner, and when the building temperature rises about one degree, the second circuit closes and the current flowing through the "accelerator element" artificially heats the bimetal and causes it to reach a temperature higher than the room temperature, cutting off the burner, which greatly reduces over-ride and lag and eliminates cold 70.

Other thermostats equipped with two wires incorporate the heat accelerator principle which is designed for lower amperage and is wired in parallel with the oil burner circuit. In this thermostat the heater element is in operation over a longer period of time, but it accelerates the opening of the burner circuit and reduces cold 70.

In thermostats of this type, one must be careful to check, to make sure the heater element is in accord with the rated amperage of the thermostat.

The heater element is attached to the base and the rated amperage is marked on the screw end of the heater element. The amperage varies in different thermostats in accordance with the degree of acceleration desired; 1.4 amperes is commonly used in this type thermostat for forced warm air circulating systems. Diagram 9, Part 11, shows a typical thermostat with a heating element.

Diagram 10 shows another accelerator thermostat which uses a factory setting of 0.6 ampere A. C., which is about normal for operation of burners. The adjusting element consists of a heater scale, plate, and pointer heater element. If the control circuit is less than 0.5 ampere, move the heater slider toward position 3 in order to shorten the "on" period. If the current is greater than 0.7 ampere, move the heater slider toward position 1, to prevent too short burner cycles. If current is 1 ampere, move slider to approximately 1½ divisions to lengthen the "on" period. Continue to change adjustments until the time of burner "on" periods extend to 10 minutes or more.

Another simple type of thermostat with maximum voltage of 250 volts, two wires, consists of a charged sylphon bellows, operating an armature with main contact post and auxiliary silver contact. This thermostat incorporates a patented permanent magnet structure and is arranged to close the circuit at low and open at high temperature differential setting.

Too Much Stop and Start

Thermostats may cause too frequent starting and stopping of the burner, uneven heat, insufficient heat, or no heat at all, which may have resulted from many of the following causes, viz.:

a—Contact points may have become pitted or dirty.

When dust or dirt accumulates on thermostat contact points, clean by drawing a piece of hard finish paper between the contacts and blow out loose dirt. Do not use file, emery paper or other abrasives on sharp points. Occasionally when disk contacts become pitted, it becomes necessary to touch them up with a very fine file or emery cloth. Use carefully and do not take off too much metal from disk.

b—Loose contact at thermostat or stack relay.

c—Broken wire in thermostat cable.

d—Thermostat may have been located in a cold draft.

e—The thermostat temperature differential may have been set too close.

f—In a heat accelerator thermostat, this condition might have been caused by a heater element of too high amperage.

The higher the amperage in the heater element, the more quickly the element becomes heated, which in turn heats the bimetal of the thermostat and prematurely cuts off the burner circuit. If the amperage is too high, the burner will recycle at too frequent intervals.

g—Incorrect color sequence in connecting low voltage thermostat wires.

h—A short circuit between blue and white wires.

i—The contact at the point where the short circuit occurs may be very feeble, which would require considerable time to affect the warp switch heater sufficiently to cut off the burner on safety.

If a clock thermostat, the clock may have stopped, or in case of an eight-day clock, the day dial may be out of calibration with the 24-hour day-night dial, or temperature indicators may have been incorrectly set.

In case it is necessary to lengthen the time operating period, follow manufacturer's bulletin.

Overheating

Overheating by the burner may be caused by:

a—Thermostat may be stuck.

b—Short circuit between two wires in the thermostat circuit.

c—Thermostat may be located in a cold draft.

Minor repairs and adjustments can be made in the building; however, major repairs in most cases are made by sending thermostat back to the manufacturer or replacing with a new one.

Definitely, the lowering of night temperature will save fuel, but it is quite difficult to make an accurate calculation as to the exact amount in fuel that will be saved by cutting down night temperatures.

It is possible with intermittent firing oil heat to obtain very uniform room temperatures. Frequently over a period of 24 hours a recording thermometer will not vary more than from one to two degrees in temperature.

2-Wire Snap Action Thermo.

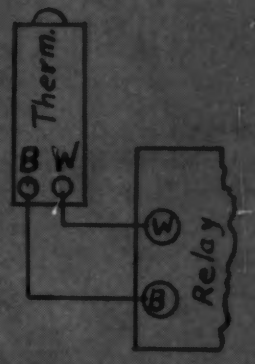


Diagram 6

3-Wire Low Voltage Thermo.

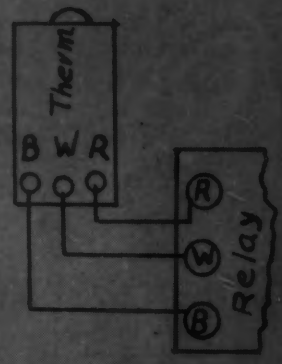
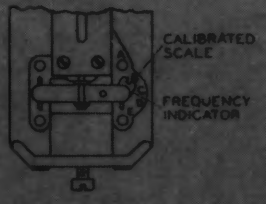
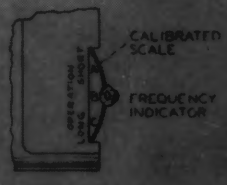


Diagram 7



INTERNAL ADJUSTMENT



EXTERNAL ADJUSTMENT

Diagram 8

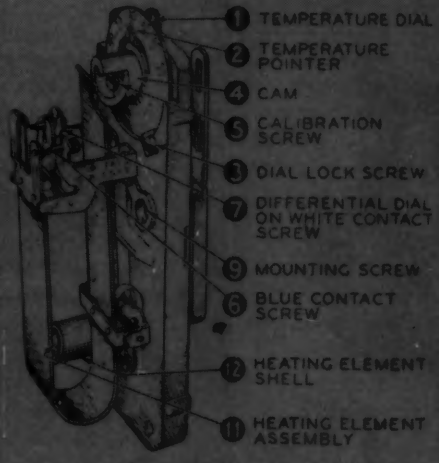


Diagram 9

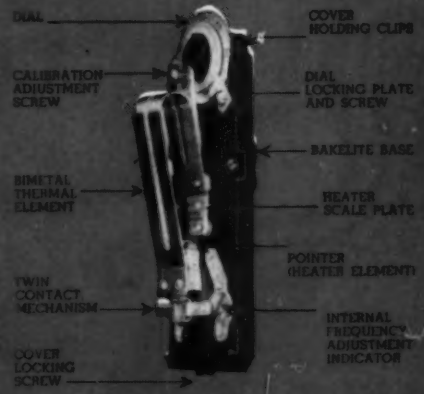


Diagram 10

We Can Simplify Our Engineering by Using One Bonnet Temperature* [Part 2]

Part I of this article appeared in the March issue. Part I outlined the results from variations in air volume; the results using high registers; and value of air change.

Changes in Bonnet Air Temperatures (*Series* 4, 5, 6-40): The significant results obtained from the series of tests made with three different settings of the bonnet thermostat are shown in Fig. 4. The average bonnet air temperatures shown by the abscissae represent the mean of corresponding maximum and minimum bonnet air temperatures. All tests were made with high sidewall registers, with a total air delivery of 800 cfm, and with register openings as shown in Table 3. With the exception of one case, the register air velocity was approximately 600 fpm. The full line and broken line curves represent data for indoor-outdoor temperature differences of 34 F and 55 F respectively. The temperature differences between ceiling and breathing level, and between breathing level and floor are shown by the top set of curves. Reducing the bonnet temperature by lowering the setting of the bonnet thermostat tended to slightly lower the ceiling temperatures but had no appreciable effect on the floor temperatures. No data were obtained with different bonnet air temperatures used in connection with higher air deliveries, but Fig. 4 indicates that only slight increases in the temperature of the floor and decreases in the temperature at the ceiling could have been made by operating the plant with lower bonnet air temperatures accompanying the higher air deliveries.

One series of tests (3-40) was conducted at the low air delivery of 800 cfm for which the original size of the register was retained, thus resulting in a register air velocity of approximately 290 fpm instead of 600 fpm. The results are shown by the triangles and solid circles in Fig. 4. The only noticeable effect with the comparatively low bonnet thermostat setting was an increase in the temperature of the air at the ceiling.

Although the effect of reduced setting of the bonnet thermostat on the room temperature gradients was small, in other respects the most satisfactory operation was obtained with the lower values of the bonnet air temperature.

Table 3—Register Opening Areas
(*Actual and Calculated, for 800 cfm Air Delivery*)

Room	cfm Calculated	Register Areas, Square Inches		
		Calculated	Actual	Difference
Living	144	34.6	9.6	—25.0
Hall	48	11.5	8.2	— 3.3
Dining	36	8.6	6.0	— 2.6
S. Sunroom	82	19.7	18.5	— 1.2
N. Sunroom	82	19.7	25.2	+ 5.5
Kitchen	58	13.8	18.9	+ 5.1
E. Bedroom	102	24.5	18.8	— 5.7
S. W. Bedroom	54	13.0	8.7	— 4.3
Bath	13	3.2	24.5	+21.3
N. W. Bedroom	69	16.6	22.8	+ 6.2
E. Dormitory	62	14.9	12.9	— 2.0
W. Dormitory	50	12.0	12.9	+ 0.9
Total	800	192.1	187.0	= 1.3 sq ft

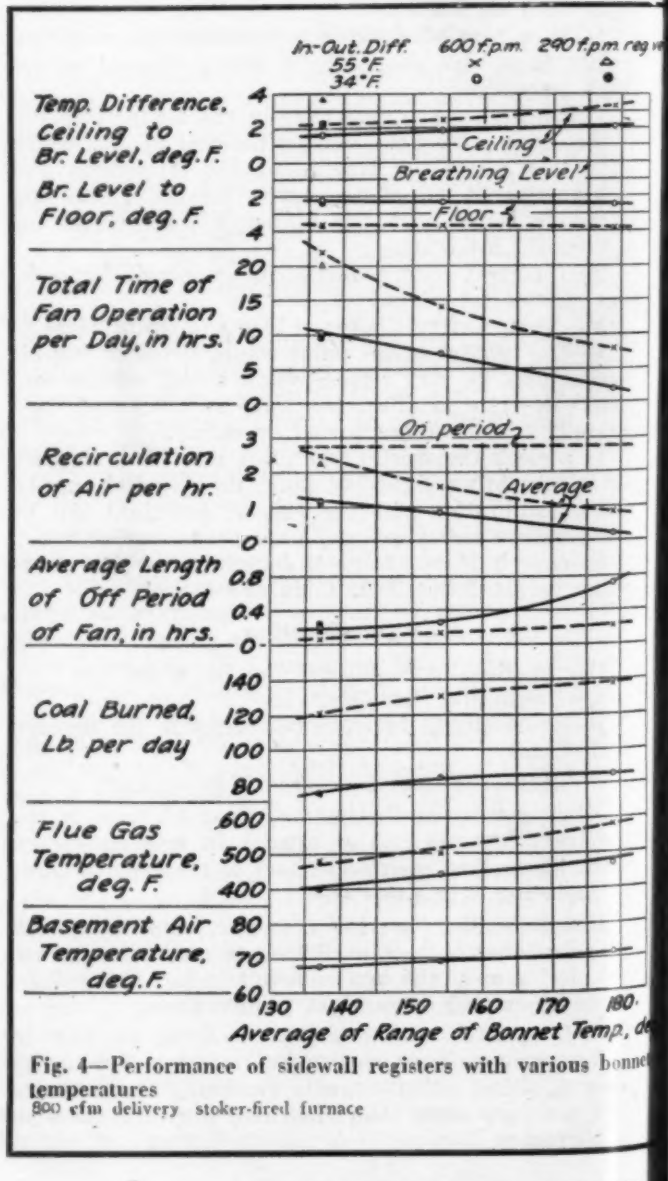

In-Out. Diff. 55°F. 34°F.
600 f.p.m.
290 f.p.m. reg
Temp. Difference, Ceiling to Br. Level, deg. F.
Br. Level to Floor, deg. F.
Ceiling
Breathing Level
Floor
Total Time of Fan Operation per Day, in hrs.
Recirculation of Air per hr.
On period
Average
Average Length of Off Period of Fan, in hrs.
Coal Burned, Lb. per day
Flue Gas Temperature, deg. F.
Basement Air Temperature, deg. F.
Average of Range of Bonnet Temp., de

Fig. 4—Performance of sidewall registers with various bonnet temperatures
800 cfm delivery stoker-fired furnace

Conclusions from a series of studies reported at the semi-annual meeting of the ASHVE, June, 1942, and published as a paper—"Performance of a Forced Warm Air Heating System as Affected by Changes in Volume and Temperature of Air Recirculated" in the June, 1942, issue of Heating, Piping and Air Conditioning.

As shown by Fig. 4, reducing the bonnet temperature resulted in a longer total time of fan operation per day, a larger average air recirculation, and much shorter *off-periods*. In fact the setting of the bonnet thermostat can be so reduced as to produce practically continuous fan operation even on days in which the outdoor temperature is not extreme. With such reduced settings of the upper limit of the bonnet thermostat, above which temperature the fan would operate, if the limit thermostat for the stoker or burner were set at a temperature high enough to take care of extreme weather conditions, the operating bonnet air temperature would be automatically proportioned to the heating demands of the structure. That is, in very cold weather the operating bonnet air temperature would automatically rise higher than the temperature indicated by the upper limit of the bonnet thermostat setting, with the net result that the heat output would be adequate. On the other hand, if the bonnet thermostat setting had been increased to a very high value, the plant would have tended to operate entirely under gravity air circulation. With a high setting of the bonnet thermostat and a given adjustment of the duct dampers the temperature balance between rooms over a wide range of outdoor temperatures was not as satisfactory as that obtained with a similar adjustment in the case of lower settings of the bonnet thermostat. Higher bonnet settings, particularly for a solid fuel plant in which some heat liberation occurs during the *off-periods* of the stoker, result to some extent in uncontrolled gravity circulation of the air during the *off-periods* of the fan and thus tend to produce inequalities in the temperature distribution between rooms.

As shown by Fig. 4, the higher settings of the bonnet thermostat were also accompanied by greater coal consumption on a given day. The increase in coal consumption could be largely accounted for by an increase in the heat losses from the basement resulting from higher basement temperature and by an increase in the flue losses accompanying higher flue gas temperatures. The latter was particularly true during the *off-periods* of the stoker.

From the standpoint of low temperature difference from floor to ceiling, long total time of operation of the fan, shorter lengths of *off-periods*, and lower fuel consumption, the most favorable results were obtained with the lower settings of the bonnet thermostat. In this connection it should be noted that when lower bonnet air temperatures are used the actual operation of the plant more nearly approaches that with continuous operation of the fan, thus approximating the conditions assumed for design. Furthermore, the amount of dampering required in the duct system to take care of variations in outdoor temperature will be dependent upon the range of bonnet air temperatures maintained, and should be the least with low ranges of bonnet air temperatures. Lower bonnet air temperatures can be used in conjunction with high sidewall or ceiling registers than with baseboard registers. The lowest allowable limit of the bonnet air temperature is dependent upon the lowest register air temperature tolerable without resulting in objectionable drafts in the rooms.

Summary

The results of these tests may be summarized as follows:

1. The forced-air heating system proved to be very flexible insofar as its adequacy to heat the Residence with air volumes and register air temperatures deviating from those selected for the design of the plant was concerned.

2. At a bonnet air temperature of approximately 150 F and with a register air velocity of approximately 600 fpm, the variations in the fan delivery equivalent to from three to six air recirculations per hour had no immediate bearing upon either the successful operation of the plant or the comfort conditions produced.

3. With intermittent operation of the heating plant at an approximately constant bonnet air temperature, although the fan delivery varied from three to six air recirculations per hour, the average air recirculations per hour including both the *on-periods* and *off-periods* remained constant.

4. The use of baseboard registers resulted in floor temperatures approximately 1.0 F warmer and ceiling temperatures approximately 2.0 F cooler than those obtained with high sidewall registers. The use of high sidewall registers permitted the employment of high register velocities and low register air temperatures without resulting drafts in the living zone.

5. The use of high sidewall registers in connection with low air volumes and high register air velocities permitted the employment of registers smaller than those usually observed in common practice.

7. From the standpoint of low temperature difference between floor to ceiling, long total time of operation of the fan, shorter lengths of *off-periods*, and lower fuel consumption, the most favorable results were obtained with the lower settings of the bonnet thermostat.

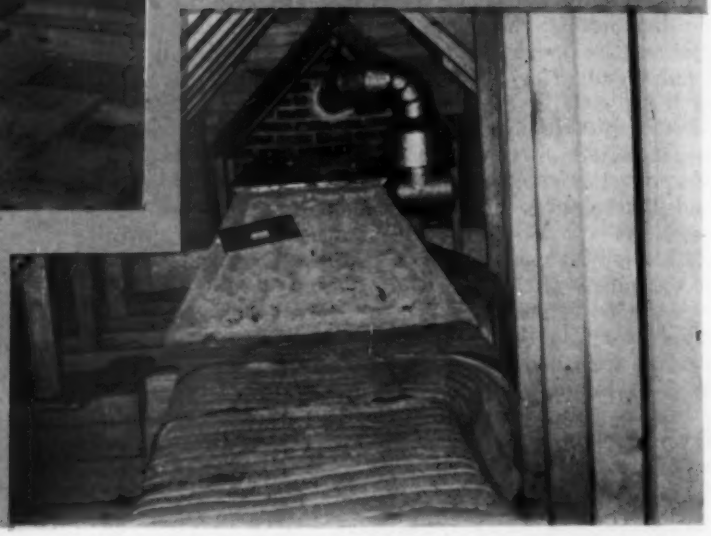
Heating Preferences

MORE than eight out of ten building contractors said they were personally responsible for determining the type of heating system that goes into 50% or more of the homes they build or contract to build and said their preference was gas heat, according to the results of a survey conducted recently by Practical Builder magazine among 5000 building contractors in 29 states.

In response to a question seeking to find how greatly building contractors influence the selection of the heating system in homes they build, 85.1% of the builders said they were personally responsible for determining the type of heating system that goes into 50% or more of the homes they build or contract to build.

When asked what their preferences were of gas, oil, hand-fired coal, and stoker heating systems, over half of the builders (57.6%) said they would use gas in 50% or more of the homes they build. Oil heating systems were the preference of one-fourth the builders (25.1%). Hand-fired coal heating was preferred by 16.1% and stokers by 9.1%.

Lennox "Stowaway" furnace in attic and insulated distribution system. Units too close to chimney to enlarge return plenum, so filters were removed to decrease resistance. Supply system unchanged; text explains additional returns.



Additional Returns and Continuous Fan Operation in 40° Weather Solves Cold Floor Complaint

IN 1941 a heating contractor in Chicago (AA, Sept., 1941) bought 100 A1-125 Lennox Stowaway attic model gas furnaces and installed them in a housing project comprising 100 identical homes. The before and after layouts shown here tell the story of how the jobs were originally installed and show the few installation changes that were made to correct a complaint of cold floors.

These houses are all without basements. They are typical two-bedroom bungalows with room enough left in the attic for the addition of a bedroom later. First floors are wood with about two or three feet of unexcavated space below. The Stowaways were installed over the living room near the fireplace chimney and the piping put in so that the extra room can be added later upstairs.

All 100 installations turned out to be very serious trouble jobs. Floor temperatures in cold weather would run 45° to 55°. Ceiling temperatures were too high.

All of the return air from the entire job was taken from the living room-dining room area. The two returns at each side of the fireplace were taken up behind bookcases. The third return was taken from a side wall of the living room underneath the davenport. The thermostat was located at the five foot level above this davenport and the fan control was all set to start the blower at about 150° and stop it at about 125°. Blowers were set for the highest speed possible on the variable speed drive.

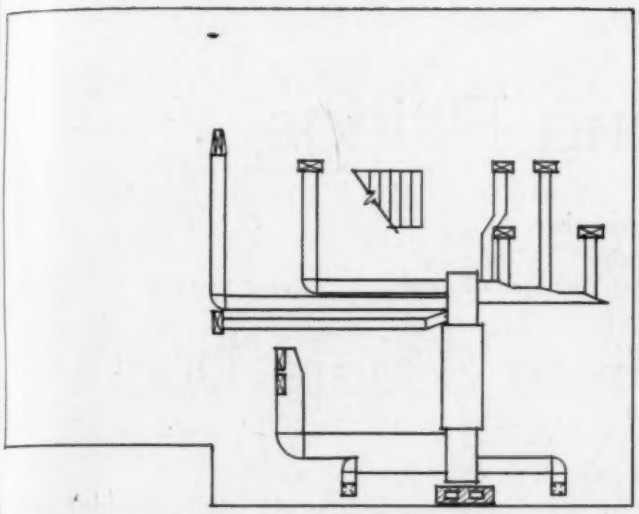
Here are the remedies which were applied by Robinson Furnace Co., Chicago. The return air under the davenport on the side wall of the living room was plugged. New returns were added in the bedrooms as shown. A new return was also added in the utility room to drain from the utility room and kitchen.

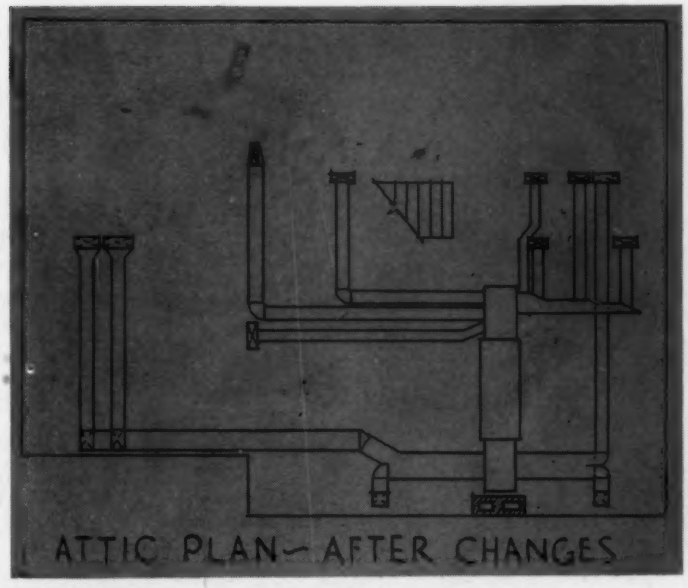
It was found that the units had been jammed back against the chimney in the attic so much that the cold air plenum chamber was too restricted. The original installer had built one 16 x 20 filter in this cold air plenum to make matters still worse. The net result was terrific resistance on the return air side.

Because it was impractical to move the whole unit Robinson removed the filter and discontinued the use of the filter. This opened up the cold air plenum so to drastically reduce resistance.

The warm air system was not changed a particle—not even a single damper in any of the warm air pipes. The change in the cold air return system and elimination of resistance in the return plenum made it possible to set the blower at almost the lowest speed possible on the standard drive and still get adequate air movement.

The room thermostat which originally stood at the five foot elevation was moved over to the wall at





Above—"before and after" piping system in attic. Note additional returns. Below—Floor plans showing new returns which take air from several rooms instead of one room only as in original layout.

the side of the stairway and put down twelve inches above the floor. The same thermostat was used which is a Minneapolis T-81 operating a Minneapolis solenoid gas valve.

The combination fan and limit control used was the standard White-Rodgers instrument with the Lennox "WEATHER CONTROL" instruction plate with knobs on the instrument for convenient changing of the limit control setting as the season changes.

The fan control was set to start the blower at 105° and stop at 80°. For mild weather the limit control was set to cut off the burner at 135° and cut it back in at 120°.

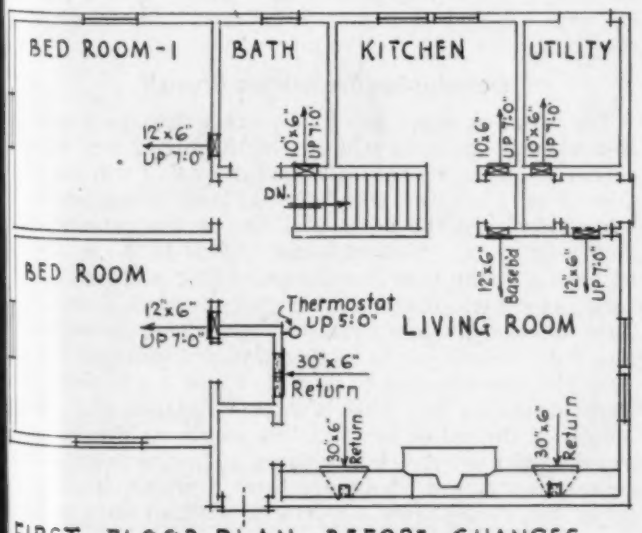
With these comparatively simple changes floors stayed within 2° of breathing level temperature. The ceilings were cool and all rooms were heated evenly in all parts.

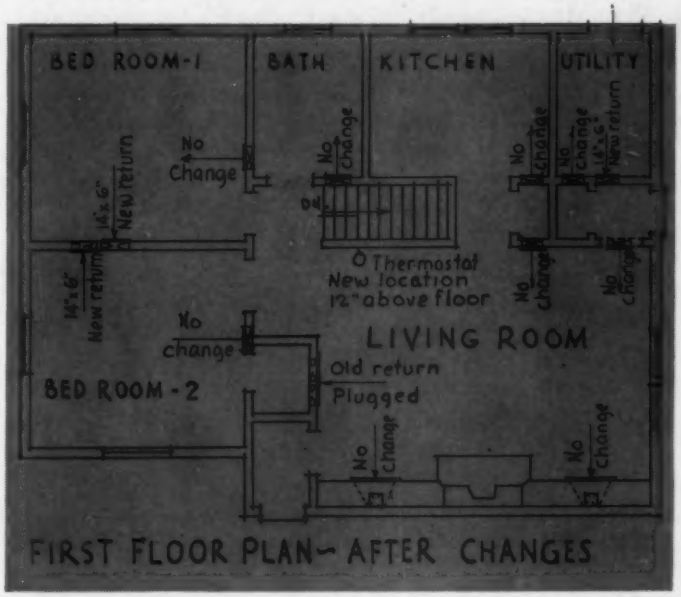
The most important single contribution to the correction of this job was the setting of the blower control to provide for continuous blower operation when the outside temperature is below 40°. No forced air heating plant, whether the furnace is in the attic or in the basement, and regardless of fuel, can work correctly unless the blower does operate continuously when outside temperature is below 35° to 40°.

Of course, it is necessary to locate warm air registers so that the air stream discharging from them does not strike a person directly. If the register is in the baseboard where the air stream can hit a person directly then you will get a complaint of a chilly breeze from the register when register temperature drops much below 120°. You cannot heat correctly with forced warm air unless the register temperature at times gets down to about 80°. Therefore, you must locate your warm air registers so that the air does not strike a person directly. They can be in the floor, in the baseboard or high on the side wall, so long as you abide by the above rule. The convenient and safe place to put them is, of course, high on the side wall because then you never need to worry about the air directly hitting a person.

Putting the thermostat down near the floor is also a big advantage. In the low location the thermostat "feels" any temperature change in the room very quickly. At the five foot elevation temperatures can

(*Continued on page* 122)





Pattern Development for

Air Conditioning Fittings*

By William Neubecker
Head Instructor
Sheet Metal Department, New York Trade School

4 Round Branches From Square Duct

IN Fig. 62, is shown the principles employed for developing the patterns for four round branches connecting to a square duct. Full size working measurements are shown. Each of the four round branches to be 8 inches in diameter and one to be connected to a square duct whose area must equal the combined area of the four round branches. As each branch radiates at an angle of 45 degrees, as shown in elevation, then it will only be necessary to draw the elevation of one branch and in its proper relative position, draw its plan view as shown at the right in the accompanying illustration. Before this partial elevation and plan can be drafted it will be necessary to compute the size of the square duct.

Computing the Areas

To avoid mathematics the use of a table on Areas of Circles will save a lot of time, and is used as follows: As the transition branch is 8 inches in diameter, follow the column of Diam. to 8, then to the right which gives its area 50.2656 sq. in.

As there are four branches then 4 × 50.2656 will equal 201.0624 square inches, the combined area of the four branches. To obtain the size of the square duct whose area will be equal to the combined area of the four 8 in. branches, extract the square root of the number 201. $\sqrt{201} = 14.17$ inches or say 14.25 inch square duct as shown in plan. Again, considerable time can be saved by using the Table, Square Root of Numbers. Simply follow the number column to 201; then the column at the right will give the square root 14.177.

Knowing the full dimensions, the plan and elevation of square duct and branch can be drawn as shown. In its proper relative position, draw the section of the round branch and space the semi-circle in equal divisions as shown by the small figures *1* to *7*. Through these divisions parallel to the angle line of the branch *a-4* draw lines intersecting the center line *1-7* in the section, also the upper line of the branch as shown from *1°* to *7°*. From the divisions *1°* to *4°* draw lines to *A* and from divisions *4°* to *7°* draw lines to *B*. These lines will represent the bases of triangles and sections, whose altitudes will be equal to heights in the semi-circle *1-7*, and the projection in plan as will be described.

Finding True Lengths

To find the true length of the valley line or the intersection joint where the four branches meet in plan, simply take the distance $A° - B^x$ in plan and set it off on the base line in elevation as from *a* to *b* and draw the line from *b* to *A* which gives the true length.

To find the true lengths of the lines in *1° - 4° - A* and *4° - 7° - B* in elevation, proceed as shown, at the right. Take the various lengths of the lines *A - 1°*, *A - 2°*, *3°* and *4°* in elevation and place them on the horizontal line *A - 4°* at the right as shown by *A - 1°*, *A - 2°*, *3°* and *4°* as shown. From these intersections at right angles to *A - 4°* erect lines, making *2° - 2*, *3° - 3* and *4° - 4* equal respectively to the projections measured from the line *1 - 7* in the semi-section in elevation to points *2*, *3* and *4*. Now draw lines from *A* to *2*, *3* and *4* in the true lengths, which indicate the true lengths of similar numbers in elevation.

In a similar manner erect a vertical line in the true length diagram, as shown by *B° - 4°*, on which place the various lengths of the lines shown in elevation as *B - 4°*, *B - 5°*, *6°* and *7°* as indicated by similar numbers in the true length diagram. From these points *4°*, *5° and 6°* draw lines at right angles to *B° - 4°*, making *4° - 4*, *5° - 5 and 6° - 6* equal respectively to the distances measured from the line *1 - 7* in the semi-circle in elevation to points *4 - 5* and *6*.

As the lower corner *B* in elevation (indicated by B^x in plan) projects from the apex *A* in elevation (indicated by *A°* in plan) a distance equal to *A° - B°* in plan or 7⅛ inches (the half width of square duct), set off the distance *A° - B°*, at right angles to *4° - B°* in the true length diagram as shown from *B°* to *B*. Now draw lines from *B* to *4*, *5*, *6* and *7°* which show the true lengths of similar numbered lines in elevation.

Developing Transition Branch

For want of space the half pattern for the transition branch has been laid out in the upper left hand corner as follows: Take the distance *A - 1°* in elevation or *A -1°* in the true lengths, both being similar and place it on the horizontal line in the pattern as shown by *A - 1*. Now with radii equal to *A - 2*, *A - 3* and *A - 4* in the true lengths and using *A* in the pattern as center, describe short arcs near *2*, *3* and *4*. Now set the dividers equal to the division between *1* and *4* in the semi-circle in elevation and starting from *1* in the pattern step to arcs *2*, *3* and *4* and draw a line from *4* to *A*. With a radius equal to the true length of the valley or joint line shown at the left of the elevation by *A - b* and using *A* in the pattern as center, describe a short arc near *B* which intersect by an arc, struck from *4* as center with a radius equal

(*Continued on page* 123)

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PATTERN FOR QUADRUPLED ROUND BRANCHES CONNECTING TO SQUARE DUCT

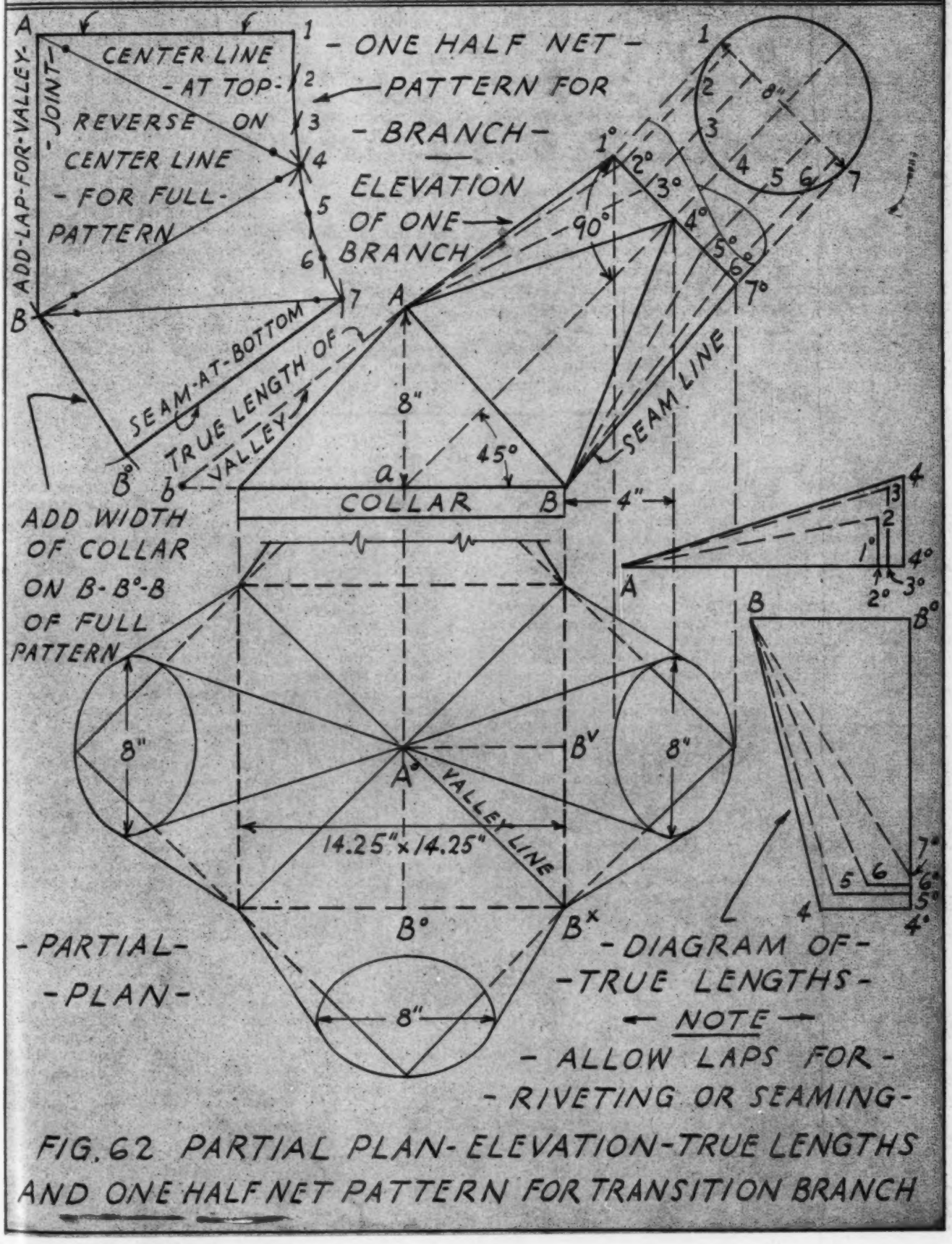

FIG. 62 PARTIAL PLAN-ELEVATION-TRUE LENGTHS AND ONE HALF NET PATTERN FOR TRANSITION BRANCH

The Coal Rationing Plan

SOLID Fuels Administration for War announces that household consumers of *all* solid fuels east of the Mississippi River and in certain other areas will be required to file "consumer declarations" with their retail dealers to receive the 80 per cent of normal allotments to which delivery will be restricted in the fuel year beginning April 1.

The declaration will show the amount of solid fuel normally required at the building in which it is used, the kinds and sizes ordinarily burned and the number of rooms to be heated.

Consumers of less than 25 tons a year will not be required to count the fuel in their bins on April 1 as part of next year's quota. This should be a real incentive to save the maximum amount possible right now to have more fuel available for the coming year.

Those using more than 25 tons per year must report their April 1 inventory in their "consumer declaration."

Required to file the declaration will be consumers east of the Mississippi River and those living in Minnesota, North and South Dakota, Iowa, Louisiana, and the city and county of St. Louis, Mo. The 80 per cent restriction applies to these areas only.

Solid fuels affected are anthracite and bituminous coal, coke, briquettes and packaged and processed fuels.

The form indicates that consumers filing the declaration before May 15 with their regular retail dealers and accompanying it with an order, will be entitled to get at least 30 per cent of their normal requirements before October 1, if they agree to take delivery of any usable solid fuel the dealer has to offer. It also states that generally dealers will be prohibited from delivering more than 50 per cent of the consumer's normal annual requirement prior to September 1.

The forms will be printed by the Government and will be made available to consumers by retail dealers about April 1. The dealers will be required to keep a record on the back of the declaration showing the date the declaration and the orders for solid fuels were received. The record must also show the tonnage and kind and sizes of fuel delivered and the date of deliveries.

Consumer Declaration

In accordance with applicable provisions of SFAW Regulation No. 26, a consumer who wants to buy any solid (such as anthracite, bituminous coal, coke, lignite, briquettes, packaged fuel) must fill out and file this form with his dealer. No dealer may deliver solid fuel to a consumer who does not file a Consumer Declaration with him.

Penalties for Misrepresentation

Any person making a false statement or representation in or on the back of this Consumer Declaration is subject to criminal prosecution and upon conviction is subject to a fine of not more than $10,000 or 10 years' imprisonment, or both.

No person is authorized to reproduce or change this prescribed form without written permission of the Solid Fuels Administration for War. The dealer shall use the back of this form for record keeping purposes.

I certify to the Solid Fuels Administration for War that the following facts are true to the best of my knowledge and belief:

1. Name
   Address of house or building to be served
   Telephone No.
2. Number of rooms to be heated————.
3. I would ordinarily burn at the above address during the year (your dealer is required by law to check the correctness of this statement):
   Tons Kind of Solid Fuel Size Dealer's Verification
4. If the number of tons reported in Item 3 is 25 or more, state the amount of solid fuel you had on hand April 1, 1945:
   Tons Kind of Solid Fuel Size
5. I am filing this declaration with————
   Name of Dealer
   and I am also placing an order with him for————
   Tons Kind of Solid Fuel Size
   and which is not more than the Government permits me to receive (80 percent of what you ordinarily burn is generally the most you may receive).
6. There is no Consumer Declaration for the above address on file with any dealer.

NOTE—The law forbids the filing of a Consumer Declaration for the above address with more than one dealer unless the consumer has customarily received solid fuel for use at that address from more than one dealer during the year. If, but only if, that has been the customary practice and you have filed or intend to file a Consumer Declaration with more than one dealer state:

Name of Other Dealer
Tons Kind of Solid Fuel Size
Consumer's Signature
Mailing Address

To the Consumer

A. Your dealer is not required to deliver any solid fuel to you unless, in addition to the Consumer Declaration, you place an order with him.

B. If you place your Consumer Declaration and an order before May 15, 1945, with the dealer who regularly supplied your house or building with solid fuel last year, you are entitled to get, before October 1, 1945, at least 30 per cent of your normal annual requirements if you are ready, willing, and able to take delivery of any usable solid fuel on terms agreeable to you and the dealer.

C. If you place your Consumer Declaration and an order promptly with the dealer who regularly supplied your house or building with solid fuel last year, and if you take any usable solid fuel offered by your dealer, he is obligated to deliver your quota of solid fuel as determined by the Solid Fuels Administration for War.

D. There will not be nearly enough solid fuel to give you as much as you ordinarily use. Generally a dealer is prohibited from delivering and a consumer is prohibited from receiving, during the period April 1, 1945 to March 31, 1946, more than 80 per cent of the consumer's normal annual requirements. You must therefore conserve fuel in every way you can. Stop your fires at the earliest possible date this spring and do not begin burning fuel next fall sooner than is absolutely necessary. Keep the temperature down to 68° or less. Shut off heat in rooms not in use.

E. Generally a dealer is prohibited from delivering, and a consumer is prohibited from receiving, before September 1, 1945, more than 50 per cent of the consumer's normal annual requirements.

Dealer's Record of Deliveries

Date Declaration and order received————
Date
Delivered Tons Kind and Size

SHEET METAL SECTION

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

STEEL
AT YOUR SERVICE

DUMB—LIKE A FOX

• We don't know everything. But we *do* know our own business—Steel. We've been in it for a good many years and are smart enough to know that our success depends upon making *our* knowledge of *our* business of practical help to *you* in *your* business. It's just as simple as that. We carry large stocks of steel and Stainless Steel, in all commercial forms. We give prompt, intelligent service. We give metallurgical and fabricating counsel on difficult problems in steel selection or production. Call us. Our experience is at your service.

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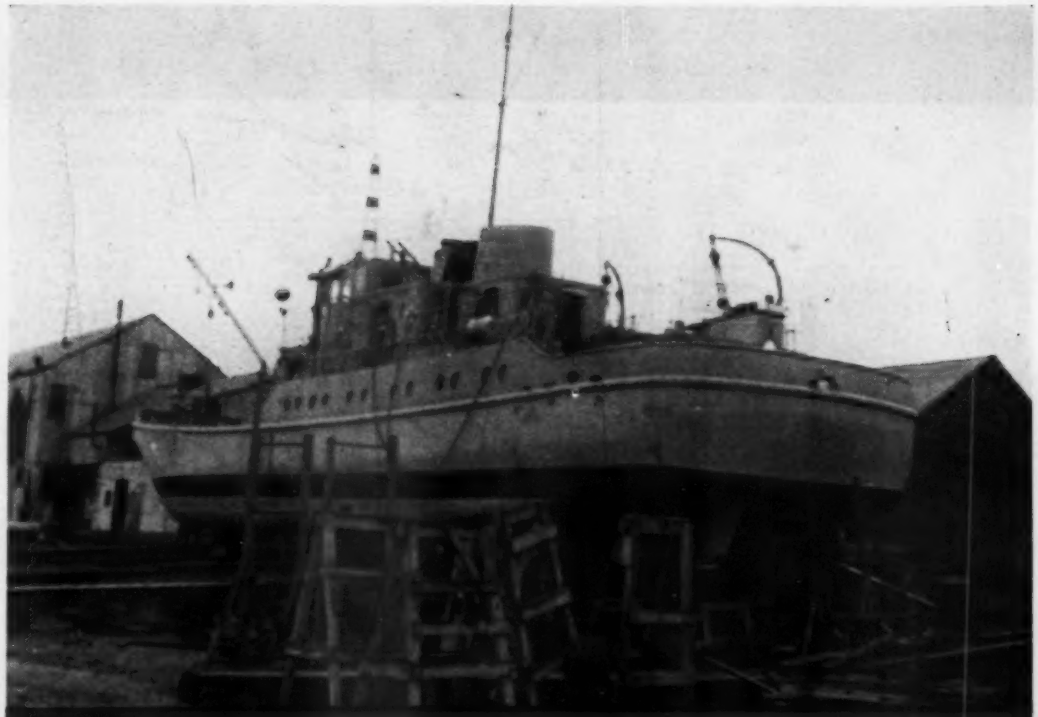


One of the coast guard cutters in the yard of Dubuque Boat and Boiler Company. Photo gives an idea of the size of the ship.

Boat Ventilation is a Problem of Weaving Ducts Through Jampacked Spaces

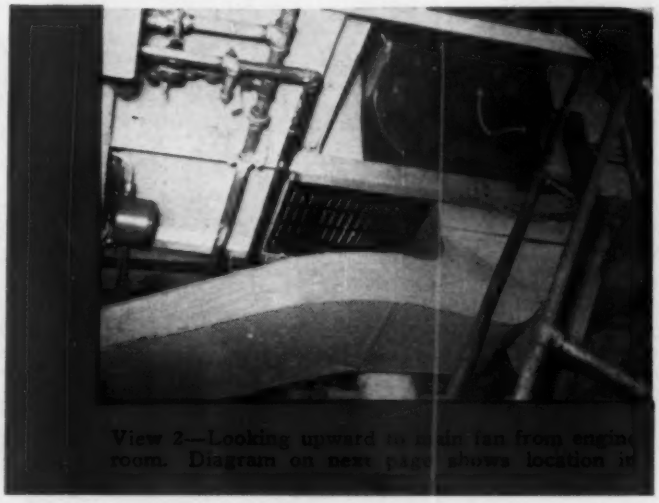
UNDER the ship construction program, many sheet metal contractors have fabricated and installed parts of or complete ventilating systems in boats of all sizes and types. The outstanding problem in this class of work, according to the contractors, is how to get the duct system through the spaces assigned and clear of the hundreds of pieces of equipment which fill every niche and cranny in the ships.

No amount of word explanation can illustrate this problem as quickly and clearly as can pictures, so this description of a typical contract in a small boat is mostly pictures and drawings. The type of construction specified and the intricacies of fitting ducts into boats are all shown in the photographs and captions.

Coast Guard Cutter Example

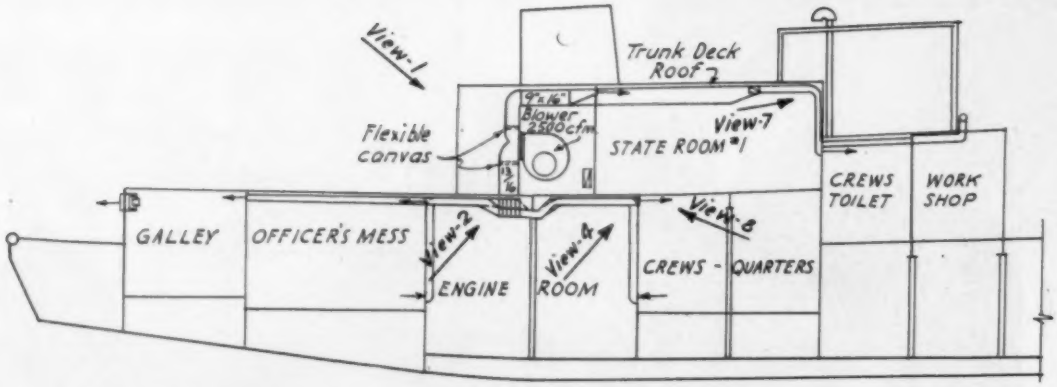
The boat here reported is a Coast Guard cutter—the general size and appearance are shown in the view of the ship in the yards. This boat is one of several built by Dubuque Boat and Boiler Company (Dubuque, Iowa). The sheet metal contractor who fabricated the duct system and installed it is Rafoth Furnace and Sheet Metal Works, of Dubuque. Rafoth has had boat ventilating systems going through his shop and under installation practically constantly for the last three years.

Most of the duct work in a ship of this type is 22 and 24 gauge galvanized iron. As shown in the details and photographs, there are also numerous heavy gauge fittings or sections (mostly welded) and the photos show clearly what a large proportion of a system is composed of fittings. This particular type of boat requires approximately 2,500 pounds of duct work of all gauges. In addition, Rafoth fabricated

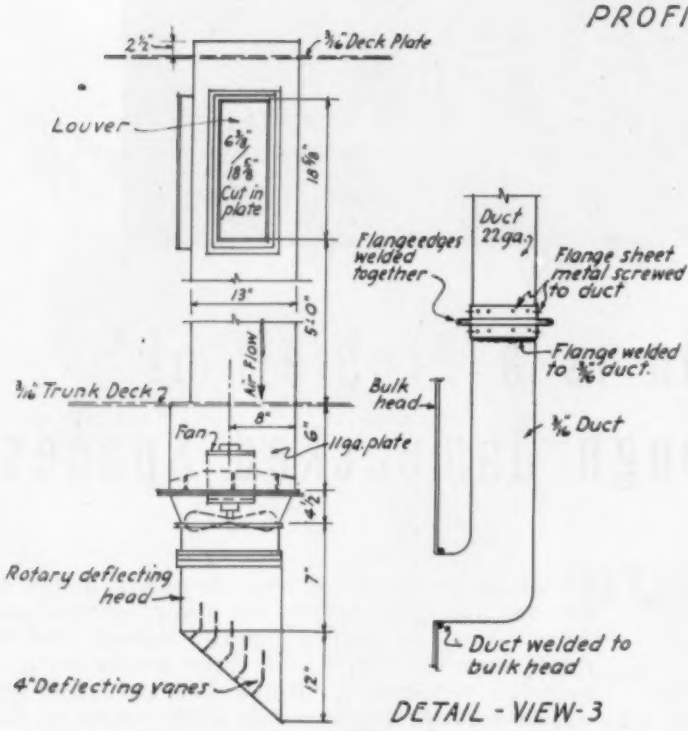


View 2—Looking upward to main fan from engine room. Diagram on next page shows location of

On the plan below large arrows indicate approximate positions at which photographs facing were taken. Drawings and photographs supply a clear picture of installation problems.

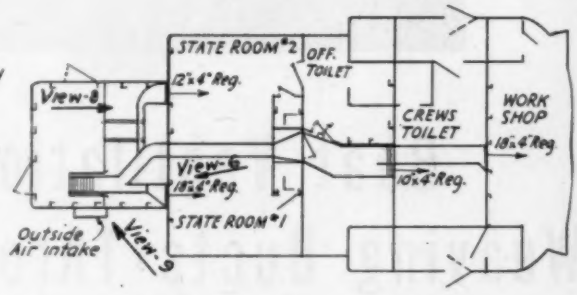


PROFILE P-P

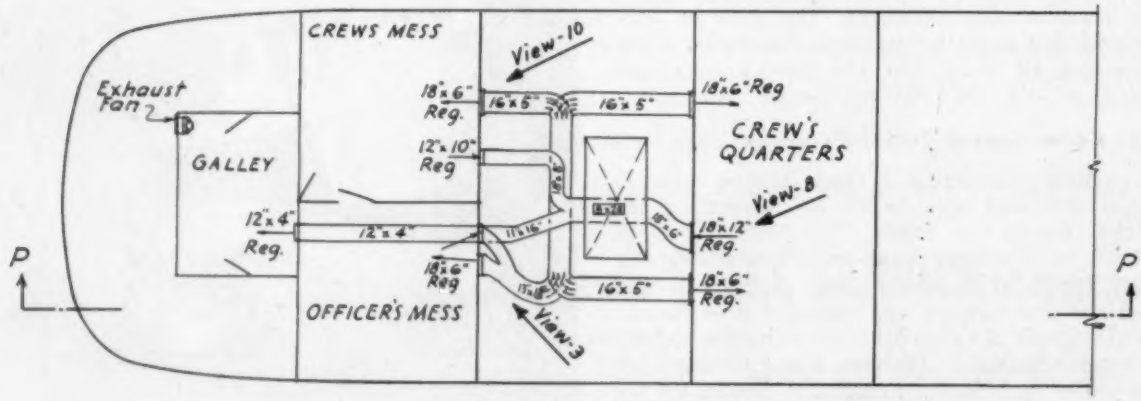


DETAIL - VIEW-3

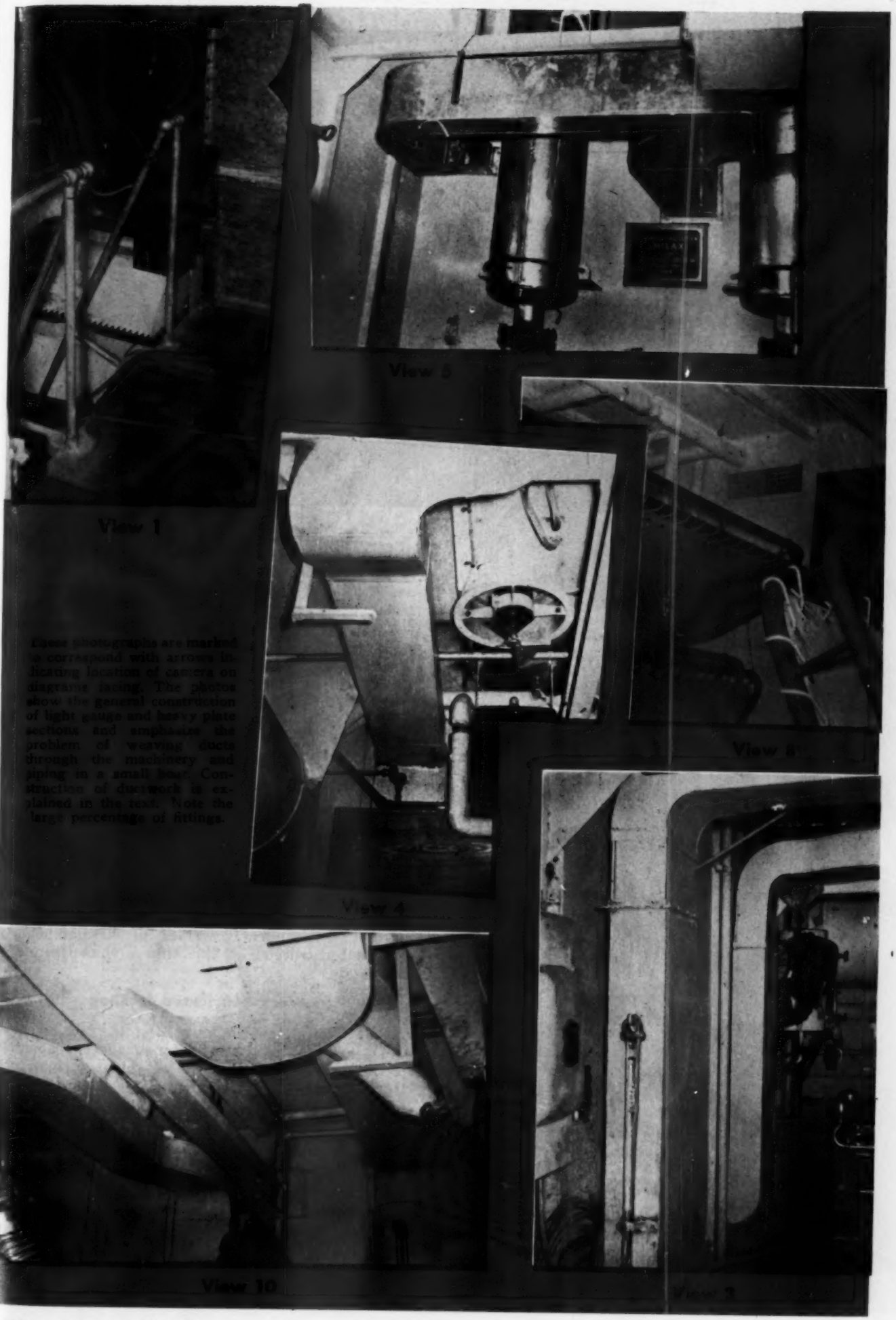
ELEVATION OF VENTILATOR

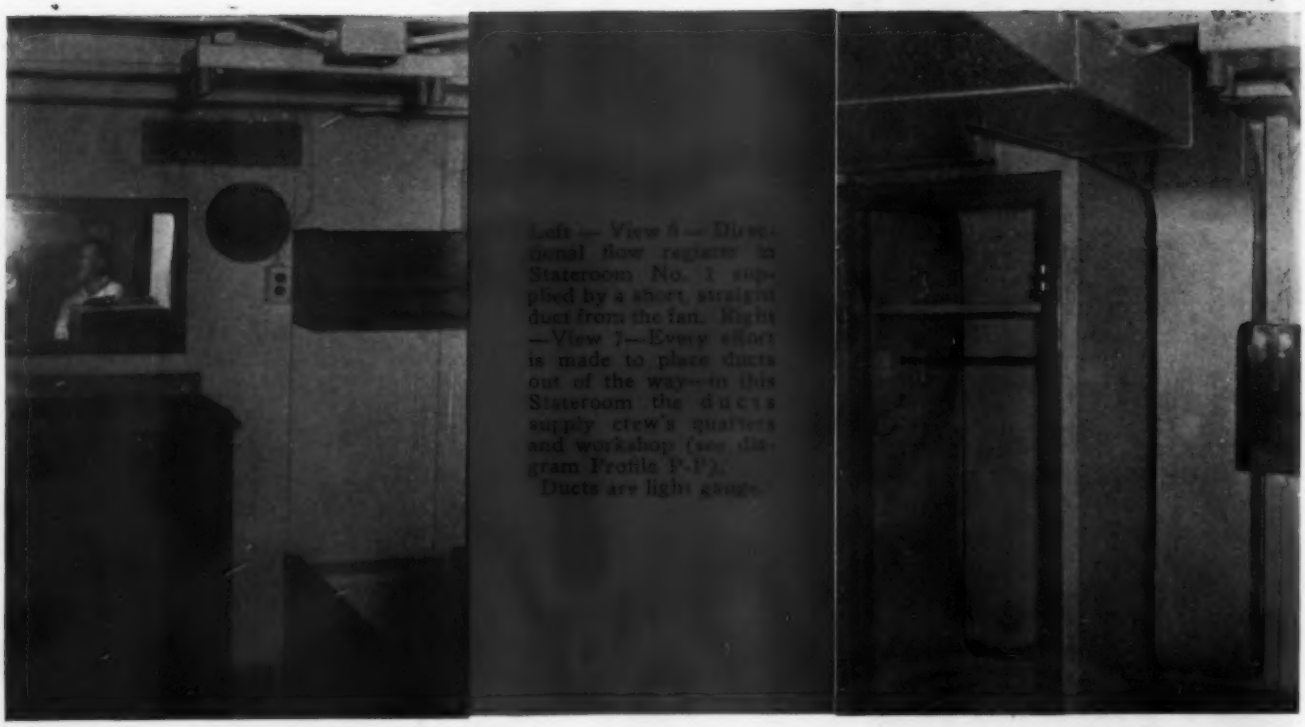


PLAN UNDER TRUNK DECK ROOF



PLAN OVER TRUNK DECK


View 1
These photographs are marked to correspond with arrows indicating location of camera on diagrams facing. The photos show the general construction of light gauge and heavy plate sections and emphasize the problem of weaving ducts through the machinery and piping in a small boat. Construction of ductwork is explained in the text. Note the large percentage of fittings.
View 5
View 6
View 4
View 10
View 7



Left — View 6 — Diagonal flow register in Stateroom No. 1 supplied by a short, straight duct from the fan. Right —View 7—Every effort is made to place ducts out of the way—in this Stateroom the ducts supply crew's quarters and workshop (see diagram Profile P-P'). Ducts are light gauge.

and installed miscellaneous items such as galley dish racks, work surfaces, cabinets—some of this construction being in 16 gauge black iron.

In boat work, meticulous drawings are furnished to the boat builder—generally the dimensions can be relied on and the spaces allocated for ducts and fittings are provided just as shown, so the sheet metal contractor can proceed to lay out and fabricate his sections from drawings. However, Rafoth, as a precautionary measure, checks fittings and distances for location on the boat itself. It should be explained that, relatively speaking, there is only a small amount of duct work and construction of a boat proceeds at such speed that the contractor can easily keep pace and still double check dimensions and locations and make up the sections and fittings as the work goes in.

View 8—Outside air intake to fan with grille removed to show relationship of equipment. See "Plan Under Trunk Deck" opposite.

Construction of the 22 and 24 gauge ducts follows usual building ventilation practice—straight sections are made up from one or two sheets, depending on width, and are put together with Pittsburgh locks made on the lock forming machine. Section joints are drive cleated on the sides and S cleated on top and bottom. Much of the duct work is self supporting between fittings; where support is needed, straps are bolted to the hull framing and metal screwed to the ducts.

In some larger boats with numerous water-tight bulkheads special provision must be made where ducts pierce bulkheads, but in boats of this cutter size and type there was almost none of this special work. The heavy gauge sections were formed in one piece of 16-gauge iron and welded. Sections were welded together. Where these heavy ducts pierce bulkheads the duct is welded to the bulkhead. A typical construction of this kind is shown in one of the details.

Work Fabricated in Shop

Being in the same town, Rafoth fabricated all work in his shop. Patterns were made on paper and metal—mostly metal because in this particular contract there were eight identical boats constructed. On this type of boat there were about 200 patterns made and used—counting lefts and rights, tops and bottoms, etc.

Installation was handled by a crew of two men, plus a welder when needed. Two men made a good crew because sections are not large or heavy and not very long. Fitting together consumed most time.

Approximately five weeks time elapsed from the beginning of work on one boat to its final completion. Of course, work progressed on several boats simultaneously.

Downdraft Ventilation for a Welding Booth

By H. T. Monson
Factory Superintendent,
The Euclid Road Machinery Co.,
Cleveland, Ohio

A METHOD of ventilating an indoor welding department in which large assemblies are welded has long been a problem in the plant in which the writer is engaged. Various methods have been devised and used, but the best system seems to be the downdraft system herein described.

This principle of downdraft ventilation has been used by The DeVilbiss Co. for some time for the exhaustion of spray-laden air from paint booths.

A comparison of the usual overhead ventilation with downdraft ventilation is shown in Photos 1 and 2. It should be noted in Photo 2 how the welding smoke travels downward under the operator's helmet. Photo 3 shows welding in another position in the downdraft booth.

Booth Design and Description

The design of the booth was made by the author upon principles given him by The DeVilbiss Co., manufacturers of downdraft booths for spray painting. Fig. 1.

This special downdraft arrangement consists of one side-enclosed chamber, or booth, with a pair of three-section folding doors on one end. It is open at the top to permit the entrance of free air.

The booth has a top opening of 12 x 24 ft. or 288 sq. ft. The air moved through this booth is 45,060 cu. ft. per minute, giving a linear or facial velocity through the top opening of 156 ft. per minute. This is somewhat in excess of the velocity used in paint spray booths, which runs about 125 to 135 ft. per minute. The excess velocity was thought desirable because of the heat generated by the arc. It should be noted that working in moving air of this velocity does not seem to cause any objectionable drafts.

The top of the side walls slope inward at an angle of 45 degrees, and along these slanting panels there

From top to bottom—Photo 1—Conventional overhead smoke exhaust system with fumes rising into welder's face. Photo 2—Same operation in a "downdraft" ventilated booth (note absence of fumes). Photo 3—"Downdraft" ventilation eliminates fumes as high as top of booth.

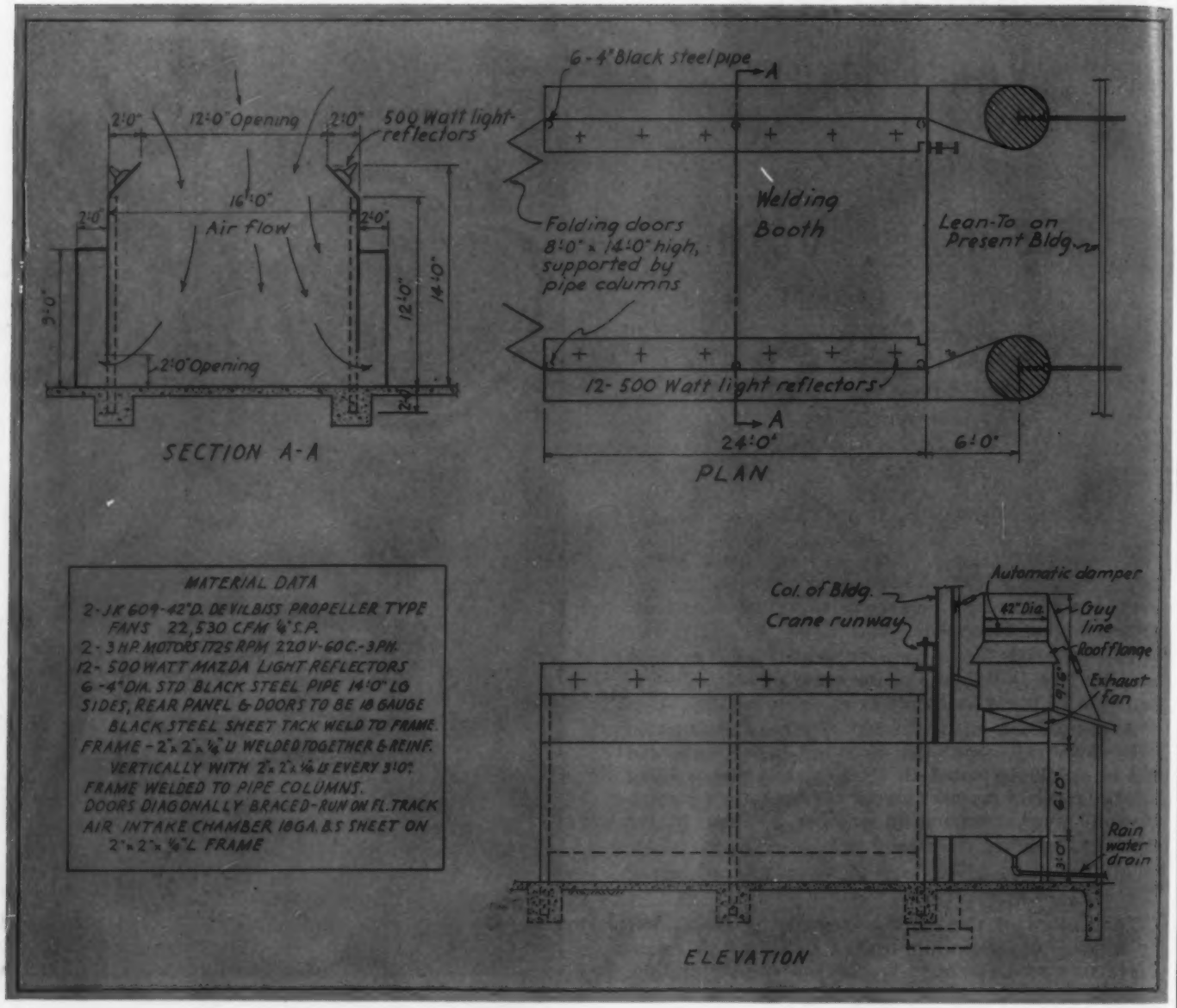


Fig. 1—Plan, elevation and details of construction for a "downdraft" ventilation booth using two exhauster fans and exhaust manifolds alon g both sides. Legend gives material data.

are openings to accommodate 12 light reflectors of a long range design which will accommodate 300 to 500 watt light bulbs.

An area 16 feet wide by 24 feet long is provided for the road machinery assemblies to be welded in the booth. Each 14-foot side of this enclosed area is supported by three 4-inch pipes imbedded two feet in concrete. There are no cross braces on the top opening so that material may be handled into and out of the booth freely with an overhead traveling crane.

The air entering the booth at the top flows downward to the bottom of each of the side walls where it enters a two foot wide manifold running the full length of the booth. Each manifold is nine feet high by two feet wide. The air flows through each manifold to the rear of the booth where it enters a 42-inch vertical stack through which it is exhausted to the outside atmosphere. There is a vertical stack for each side of the booth, each containing an exhaust fan which moves 22,530 cu. ft. of air per minute at ¼" static pressure. Each of these fans is driven through a Vee-belt drive by a 3 HP., 1725 R.P.M. motor specified for 220 volts, 60 cycle, 3 phase current.

Two design characteristics should be here noted:

(1) That the side air manifolds (9 ft. x 2 ft.) are rectangular in vertical cross section from front to rear of the booth. This nine foot dimension is maintained for the full length in order that the point of minimum quantity of air flow (the front of the booth) has the minimum amount of air restriction.

(2) That ¼" static pressure is used for calculating fan specifications in dry systems with normal flow restrictions.

It should be noted also that the exhaust stacks, which extend about 6 ft. above the roof, are located in a lean-to about ten feet high at the rear of the shop. This lean-to is an existing building.

Provision is made to anchor the stacks with guy wires and to drain rain water from the base of the stacks. Automatic dampers are located in the stacks to prevent cold air from being drawn into the building by exhaust fans in other booths if the booth is not in operation. A roof flange is provided, and also a removable panel for access to the exhaust fan.

The sides and rear of the booth are constructed of

2" x 2" x ¼" angles welded into three separate frames for each side and the rear. To these frames are welded the same size angles for vertical reinforcement approximately every three feet along the length of the panel. Each frame is covered by 18 gauge black steel sheet tack welded to the frame. Air manifolds, doors, etc., are of similar construction—2" x 2" x ¼" angle framework covered by 18 gauge sheet. Sides are welded to pipe columns and remaining assembly are welded together.

The booth is painted dull black inside and out to minimize welding arc reflections.

Shop Layout

Four booths are provided—two 16 feet wide and two 12 feet wide. The 12-foot booths are of the same construction as the 16-foot booths. They are provided with two JJ-607 DeVilbiss 34-inch diameter propeller-type fans each moving 14,750 c.f.m. of air at ¼-inch static pressure. Each fan is driven by a 2-horsepower 1725 revolutions per minute motor. The top opening for these booths is 9 feet wide and the bottom openings at base of each side panel are 18 inches high. The width of side air manifold is 18 in.

All welding will be confined to the booths with the exception of tack welding in set-up areas. Smoke from set-up welding will be exhausted from these same booths, for all present fans will be removed leaving all air flow through the booths.

Four welding machines are provided in each booth. One man of the four operating in each booth will be a booth foreman, responsible for the output of his booth because the enclosure prevents the welding supervisor from watching operations.

Large assemblies will be welded in the two large booths; small parts and smaller assemblies will be welded in the smaller booths.

Three unit heaters will be provided. One heater will operate on and off automatically with each of the two large welding booths. The third heater will operate automatically with either or both of the small booths. All intake air for these units is to be taken from outdoors.

Cost of Operation

Two factors make up cost of operating these booths. First is electricity for fan motors and booth lights which will amount to about $1,266.20 annually for this installation.

Second is the cost of heating replacement air for that removed by the exhaust system. For this installation it was decided to replace half the air exhausted for the following reasons:

(1) The area of the main plant from which the remaining 50 per cent of the heat is to be drawn is quite large. It comprises some 777,500 cubic feet.

(2) The construction of this plant is sheet metal and glass through which a considerable amount of heat is lost through openings. This heat will now be taken out through the exhaust system.

(3) Temperatures through the main plant will be maintained more uniformly at the various levels above the floor, because of the amount of air circulation that will be caused by the fans. At present, temperatures in excess of 100 degree F. exist under the roof. The air circulation will maintain a temperature under the roof that is more nearly the 65 degrees F. working level temperature maintained in this part of the plant. This gives a reservoir from which heat may be drawn, much of which is now escaping through openings in the steel building at temperatures of 100 degrees F. This is perhaps the most important consideration in arriving at this 50 per cent figure, for the heat that will normally go to building this temperature up and maintaining it can now be exhausted by the fans without notice.

Based on 100-hour per week operation and a 7½-month heating season, the cost of coal for operating these booths was figured to be about $1548.00.

Conclusion

The downdraft ventilation idea for welding booths is a new application for an established ventilating idea. The new application has been successfully tested, as described. The idea is believed to offer considerable merit for any plant engaged in manufacturing large welded assemblies. If applied, the arc welded booths as herein described can readily be made by the company desiring the booth.

Because of improved working conditions created by removing the welding smoke and by providing ventilation in hot weather, the cost advantages of this type of installation should prove favorable in most all cases.

There is still another suggestion not previously mentioned. In plants welding small bench assemblies, an open steel grating could be used for a table top with downdraft ventilation through the table top in a similar application.

Steel Is Scarce

STEPPED-UP demands for war production have necessitated a 23½ per cent cut in the total amount of carbon steel available for allotment by the Consumers Durable Goods Division of the War Production Board to manufacturers of approximately 60 classes of durable goods for use in the second quarter as compared with the first quarter of 1945.

The total amount of copper available for second-quarter allotments by the division has been reduced by about 10 per cent.

These cuts will be absorbed to varying degrees by the affected industries. Allotments to manufacturers of dry cell batteries, photographic equipment, hospital beds, marine fans, pocket knives and other items needed in quantity by the armed forces will be cut slightly, if at all. Allotments to manufacturers of items used solely or mainly by civilians, such as electric irons, electric ranges, furnaces, bedding and ice refrigerators, will be cut by correspondingly higher percentages. The amount of material available for manufacturers of irons, ranges and other items is less than the amount estimated by the Consumers Durable Goods Division as being needed to meet previously approved second-quarter production program. Manufacturers of some types of durable goods therefore may not be able to produce to the extent of authorized programs.

Getting the Most Out of Your Press Brake

1001 Standard and Special Bending Forming, Flanging, Punching Operations Your Press Brake Can Perform

By Ernest E. Zideck
Sheet Metal Consulting Engineer

The Importance of Proper Gaging

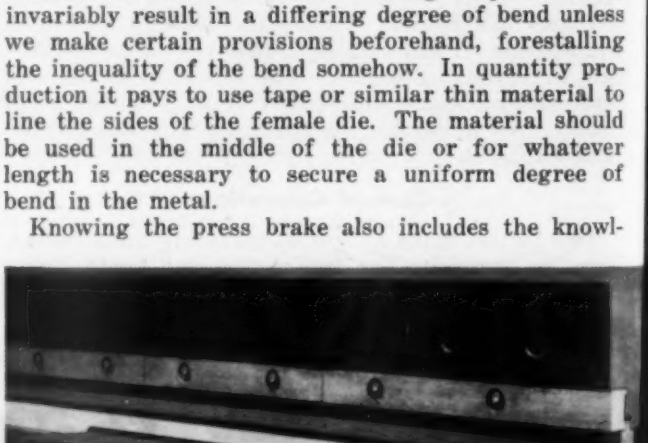
LL press brakes, regardless of make or model, operate on the same principles, and the operator, once he has familiarized himself with the mechanism of the particular brake which he uses in his work and has learned how to make the machine perform without hitch, has then to consider only the dies and thickness of the metal which he processes through the several brake operations. The dies adapted for different sorts of formative work will be illustrated and described as we proceed. The thickness of the metal, its soft or hard or semi-hard quality or finish, and the difference they make in working it in the brake will be progressively approached.

Press brake work can be done almost as uniformly as if we processed the sheet metal through stamping presses or forming dies, doing the formature at one single stroke. Adjustments of the die-descent and of the gages holding the metal in position are the means by which the degree and accuracy of bends and shapings can be accomplished. It is imperative that the brake operator bear in mind that a 12-inch long piece of metal will behave very differently in the brake than will a strip of metal 6 or more feet long. The short piece will require die-descent differing from that required by the long strip. It will, therefore, prove useless to do the try-out of bends on short pieces if we are to work on long pieces. The only useful tryout must be made on a piece identical with that which we are to process through the brake.

The above applies especially if we use multiple operations in forming the metal to proper shape. And as it will be practically out of question to have a special die for each formature which the general shop will be called upon to do in the press brake, we must acquaint ourselves with the details of the procedure we shall encounter in the great majority of the shops doing such work. It pays to have special dies, especially when we have but one product and use the press brake for that one product only. But in a shop which makes a variety of products, working on them intermittently, and where the formatures are not too intricate or dissimilar, the general practice will be to use standard dies for these common shapings and use the more special dies only when it pays to do so. Even then, in the experimental stages of a contemplated staple product, forming work will be done by standard means.

Knowledge of the press brake, aside from knowing its mechanism and how to operate it efficiently, consists in knowing what the brake will do and how we can apply our ingenuity to doing it. We know, for instance, that the sheared 8-foot piece of metal will bulge out in the middle by about 1/32 inch in lighter gauges and by almost 1/16 inch in heavier gauge metals. We therefore are careful to gage the sheared metal uniformly from each end, so that the ends of the formed piece, which ordinarily are fitted into their counterparts, come out alike in the width of the flange or step. We also know that, especially in heavier metals, the brake will form more readily at the ends than it will at the middle of the long strip. This will invariably result in a differing degree of bend unless we make certain provisions beforehand, forestalling the inequality of the bend somehow. In quantity production it pays to use tape or similar thin material to line the sides of the female die. The material should be used in the middle of the die or for whatever length is necessary to secure a uniform degree of bend in the metal.

Knowing the press brake also includes the knowl-



These gages have full horizontal and vertical adjustment and may be used on either front or back of the press. Contact gage "A" moves horizontally and is clamped by "B". Final adjustment is made by micrometer "C" locked by "D". Photo from The Cincinnati Shaper Co.

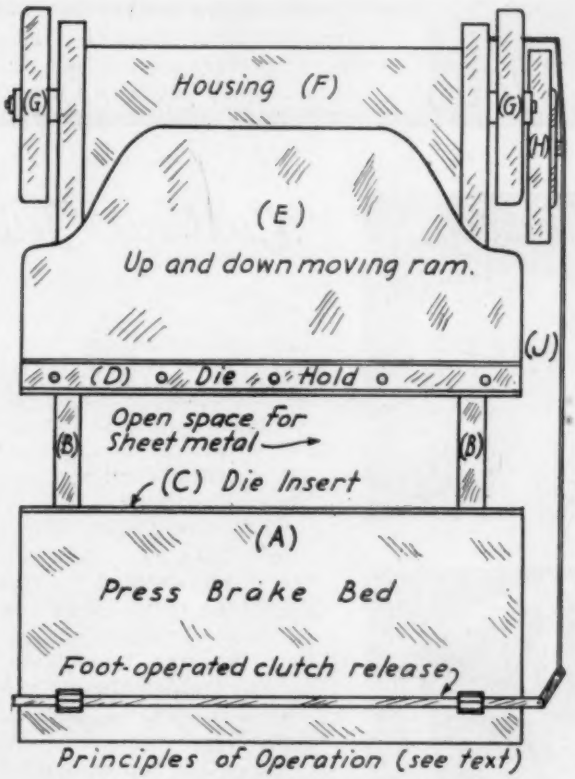


Fig. 1- Press Brake

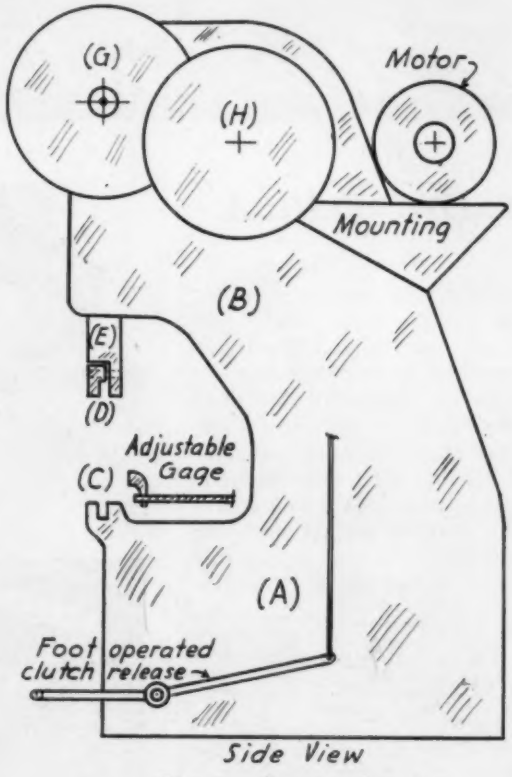


Fig. 2- Press Brake

The drawings above do not represent any one make of press brake. They show the general principles of construction and operation and illustrate the parts which are described as follows:

(A) represents the "bed" of the brake, usually mounted on a concrete floor as directed by the manufacturer. In Fig. 1 the "bed" extends over the "posts" (B) and (B). Many makes of brakes have no such extensions, the "bed" terminating with the posts (B) and (B), as shown in Fig. 2. The posts (B) and (B) terminate in an upper housing (F), which carries the heavy shaft on which rotate (G) and (G). (G) and (G) actuate the movable ram (E). (H) indicates the motor-driven, heavy wheel which engages the clutch released by (J). This clutch mechanism varies so greatly between makes or models that we show just the general principle.

All the brake operator needs to know is (1) he pushes the button which starts the main motor, putting wheel (H) in rotation; (2) the operator waits until the wheel has reached full speed, then he releases the clutch. The wheel (H) is in continuous rotation as long as the motor runs. (3) The ram (E) starts working when the clutch is released by the operator; the ram makes only one stroke unless the operator continues to press down on the clutch release continuously, then the ram will travel continuously up and down.

Many makes of press brake have a special "ram stroke adjustment mechanism" operated by a second, smaller motor. Other makes of brake have an adjustment by a hand operated device. Both of these systems have adjustment of the ram to control the desired depth of descent. Adjustment is made after the "dies" are inserted and ready for work. Then the ram is operated down and adjusted by the above device to the depth required for the work on hand. For fastening the selected die in the ram, there is a bolting arrangement (D), which tightens the die-prong in between the (D) and the ram portion, as shown in Fig. 2. (C) indicates a slot extending the whole length of the brake bed to receive the prong of the lower die. The die simply reposes on the slotted portion of the bed (A), and needs no special fastening.

edge that the distance-gaging from either the sheared edge or from a previous bend must be uniform at both ends. This is obvious, but what is not commonly observed is that there will be a difference in the distance from the gage if the metal is held level to the gage and when one end is held level and the other end is not level. That prescribed width of the flange or step might be 1 inch. But if we hold the metal out of level to the gage, the distance might grow to 1⅛ inch. And in the routine brake work, the operator handling the one end of the long piece might hold his end horizontally while his helper at the other end might incline the strip, thereby losing the prescribed, gage-set distance.

Furthermore, as will be more completely discussed later, in the knowledge required for doing good work on a press brake must be included the admissible descent of the male die into or onto the other stationary die. If we work the softer metals, we might experience a groove formed in the metal because the descent of the movable die has been allowed to strike too deep. In the harder metals this carelessness might result in the metal being "cut"—falling apart when it is handled in assembly. The descent of the movable die should be regulated to the gauge-thickness of the metal worked at the time. Even if the degree of the bend should be less than prescribed, we should not try to make it correct by increasing the die descent. Rather, we should re-strike the metal in the bend, using softer metal to cover the stationary die.

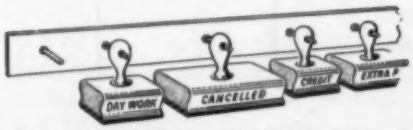
The Idea Exchange

Production ideas others have found useful. Your ideas are invited. Illustrate if possible.

Use for "Stubs"

AN IDEA for using welding electrode stub ends that has proved exceptionally advantageous as well as unique was demonstrated by an Ohio manufacturer who fabricated a simple holder for rubber stamps, using the stub ends as holding pins (see sketch).

Said to be practically indestructible, this simple gadget consists of a length of 1½-inch scrap flat stock with a series of 1½-inch



electrode stubs welded directly to one side of the metal piece at a slight upward angle. The stub ends are spaced according to the widths of the stamps.

Holes, slightly larger than the diameter of the electrodes are bored through the wooden handles of the stamps so that the units can be slipped over the stubs as shown.

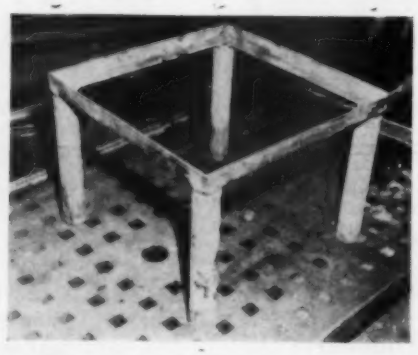
The holder is fastened to the wall directly over the desk, out of the way and within convenient reach of user.

Lincoln Electric Co.,
Cleveland, Ohio

◆

TODAY, when overalls are hard to get, most workmen still wipe a soldering iron on their pants when it comes from the furnace. At the Doid Kerns Sons Co. Shop in Lancaster, Ohio, they had the happy idea of taking an old floor brush and nailing it to the underside of the bench a little to the right of the soldering iron furnace. It is now almost automatic for the men to take the iron out of the fire, drop it underneath the bench, and give it a swipe on the bristles of the used floor brush. This little idea not only makes the solder stick better but also saves scarce overalls.

Oscar Erk,
F. O. Schoedinger Co.
Columbus, Ohio



Cutting Table

WE WERE badly in need of an oxygen-acetylene cutting table in our maintenance welding shop; one that we could place a piece of plate steel on so that it would lay flat and we could cut out repair parts and shaped pieces and even cut clear across without moving the piece or ruining the table.

Having some short scrap ends of tubing left over from our manufacturing operations, we took nine pieces of 9" tubing, cut them each 18" long and set them up on end on a flat surface. Then with our arc welder we tacked them all together, three each way in a square unit. (See Photo.)

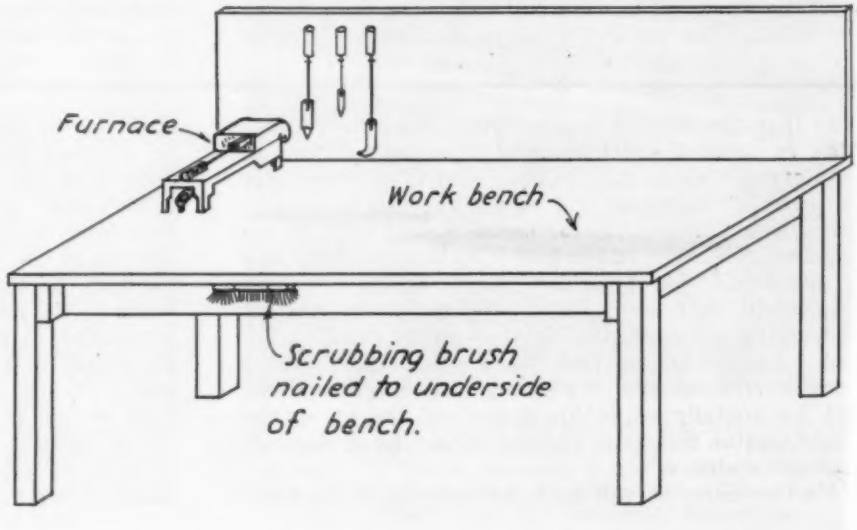
Then using some scrap ¼x2x2 angle iron, we made a square frame and welded four pieces of 2¼" pipe 18" long on the bottom of frame for legs. Setting the pipe unit into the frame, we have a cutting table 27"x27"x36" high. The size can be optional, more pipe, bigger table. (See Photo.)

When the top of the table gets rough and cut up from use, turn the pipe unit over and you have a new surface. When this, too, gets rough, break welded tacks from the pipe and cut about 2" off of ends of each pipe and tack weld the pipes together again for several more months of service.

The table is clog-free and scrap and slag can easily be removed from under it with shovel. It is also safe for the welder, the pipes guiding the sparks and slag straight through to the floor.

The Hobart Brothers Co.,
Troy, Ohio

Soldering Iron Cleaner



Cold water pouring into a heated copper gutter during test in the Revere Laboratory

WE HAD "Cloudbursts" MADE TO ORDER

This photograph, made in the Revere Laboratory, shows an experimental copper gutter carrying off a volume of cold water at least equal to that of a summer "cloudburst". But the most interesting part of the picture are the electric heaters which can heat up the gutter and make it expand almost the way mercury rises in a thermometer. Then, chilled with a torrent of cold water, its contraction is just as great. In this way, a temperature range of 160° was produced at will.

We found that, if a gutter or roof panel has insufficient columnar strength to overcome sliding friction and other forms of resistance, it will buckle when it expands and straighten when it contracts. No wonder sheet copper construction, even when installed by the most experienced men, has sometimes failed in service under such alternate bending and straightening!

Once the principle was clear, Revere worked out improved methods that reduce this type of construction to a matter of engineering design. Simple, easy to understand and practice, they insure the long life you expect from sheet copper in new construction and in repairs to older installations.

Details will be fully explained and illustrated in a new booklet now in preparation. On request, we will put your name on our list to receive a complimentary copy when issued. Write the Revere Executive Offices. Revere materials are handled by Revere distributors everywhere. For help in any difficult problems, call on the Revere Technical Advisory Service, Architectural.

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Engineering Schools on The New Code and Manual

Vorys Brothers School

Vorys Brothers, Inc., 79 E. Goodale Street, Columbus 8, Ohio, reports that their school, held in the ballroom of the Seneca Hotel, Columbus, on March 2, was a great success, to their way of thinking.

Over one hundred dealers and engineers attended this meeting, which was preceded by a dinner with the school starting at 7 p. m. and continuing until 11:00 o'clock. Due to wartime restrictions, invitations were confined to the

Left to right: Arthur M. Vorys, Newt T. Hess, E. C. Johanson, Herman Vorys, J. R. Thompson, E. W. Tabor, J. W. Wolfe.

dealers and engineers of the immediate Columbus area. There was no selling or advertising and no mention made of any product handled by Vorys Brothers. Everything was kept on a non-commercial basis.

The new Manual, Section 7, for the design and installation of the warm air heating and winter air conditioning systems was introduced. Vorys Brothers feel that this new code represents a landmark in warm air heating, because it represents the first real step in bringing the design of forced warm air heating from an engineer's job to an easy task for a furnace dealer or his office girl. Any code, however, regardless of its simplicity or engineering detail, must be backed up by years of practical experience.

In the school, no attempt was made to teach those present the heating business; no attempt was made to give dealers a college engineering course in one evening, but Vorys believes that they did teach those present the use of this new easy method of figuring forced warm air heating jobs.

With a sample job, the school figured the heat loss, and laid out and sized all registers, branch lines, and trunklines, so that the dealer had all the pertinent information to price the job and put it in.

Arthur M. Vorys, President of Vorys Brothers, Inc., started the meeting with the welcoming address, and an explanation of the part that the National Warm Air Heating and Air Conditioning Association has played in the development of this Code. He stressed the benefits which can be secured by the furnace dealer from membership in the National Warm Air Heating and Air Conditioning Association, and urged those present to become members and to subscribe whole-heartedly to the present advertising program. He stressed the desirability of the furnace dealer using this new standardized code along with the simplified practices, the standardized fittings and registers, and the other benefits set forth in this new Manual. The school was conducted by Newt Hess, Market Manager of Vorys Brothers, Inc.

An additional meeting in Springfield, Ohio, on March 16 and in Zanesville, Ohio, on March 23, will complete this series of schools.—Newt T. Hess, Market Mgr.

Mansfield, Ohio, Holds School

The Mansfield Warm Air Furnace Dealers' Association of which A. G. Earnshaw is temporary secretary, held a three-day heating school on February 26, 27 and 28, attended by eighteen of Mansfield's nineteen furnace dealers and by two dealers from nearby towns.

In almost every instance, each dealer was accompanied by his key man or heating engineer. The classes were conducted by Clarence Grandstaff of the C. A. Olsen Mfg. Co., Elyria, Ohio, assisted by C. L. Travers.

The classes were from nine in the morning until five at night for the entire three days. The subjects covered were "The Standard Code" and "The New Manual." A fee of $15 was charged for the course. The proceeds, less expense, went into the treasury, for the good of the order.

It is proposed that subsequent meetings will feature speakers who will bring a message of an educational and instructive nature.

The committee of the Mansfield association has reviewed many codes and has submitted a final draft to the City Council. An engineer and architect have been employed by the city to review this code and a general building code. The progress made indicates that the final overall building code, which includes the heating code, would be ready for the council by May 1. In substance, the gravity forced air code has been patterned along the lines of the Minneapolis code and the new Manual (Section 7 of Practical Warm Air Heating).

A. G. Earnshaw, Temporary Secretary.

◆

Luxaire-Moncrief School

The Luxaire-Moncrief Heating and Air Conditioning School, sponsored by the C. A. Olson Manufacturing Company of Elyria, manufacturers of Luxaire warm air furnaces and air conditioning units, and The Henry Furnace Company of Medina, Ohio, manufacturers of Moncrief heating equipment, pipe, and fittings, was formally opened at Cleveland on April 3rd by Edward P. Hayes, Vice-president.

Approximately 165 jobbers and dealers from the Greater Cleveland area enrolled in the school.

In his opening address, Mr. Hayes stressed that today, the heating industry should sell comfort in home heating rather than merely furnaces, pipes and grills.

Technical sessions were conducted by Clarence L. Grandstaff, a member of the Luxaire Engineering staff. With the aid of house plans and the newly developed engineering and educational literature of National Warm Air Heating and Air Conditioning Association, he instructed the group on modern methods in figuring and installing both gravity warm air heating and air conditioning systems. The question and answer periods following the instruction showed that valuable information was obtained by the group.

W. T. Clark, Manager of the Residential Division of The Cleveland Electric Illuminating Company, talked on what the home owner of tomorrow is going to demand in heating equipment. He also emphasized the large potential heating market which the greater Cleveland area offers.

In cooperation with engineers of The East Ohio Gas Company, the new improved Luxaire Ribbon-type gas burner was demonstrated. The gas demonstration showed those in attendance how to make the necessary adjustments to secure the right kind of flame; also the causes of pilot failures and how to correct them. The school included elementary instructions in how to wire controls, how to read wiring diagrams and the rules for location of thermostat, fan and limit switches.

(*Continued on page* 106)

ASSOCIATION ACTIVITIES

Indiana

The officers of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana held a meeting in South Bend, March 5th, to take up business matters of the association. James R. Walker, Vice-President, automatically became President to succeed Frank G. Sink, until the coming election of officers.

The officers vote was taken to hold meetings four times a year to discuss important business pertaining to the Association. The next meeting will be held some time in the latter part of May.

Homer Selch, Secy.

◆

Cook County, Illinois

The Sheet Metal Contractors Association of Cook County held their regular monthly dinner meeting at 12:30 p. m. on Wednesday, March 21st, at the Builders Club, 228 N. LaSalle Street, Chicago.

Reports were made by the various committees and routine business transacted.

The membership committee, of which Richard Robinson of American 3-Way is chairman, is especially active and has several new members in prospect.

The apprenticeship committee has been holding regular meetings with the joint board and report a few men have been indentured.

The meeting adjourned at 2:30. The next meeting is to be held on April 18th at the Builders Club.

William J. Perkinson, Pres.

◆

St. Louis

Associated Sheet Metal, Air Conditioning and Heating Contractors of St. Louis, Incorporated, reports the following new officers for 1945, installed in January:

President—Ralph Albright
Vice President—Louis Otten
Treasurer—B. Kolbenschlag
Secretary—Wallace Cavallo
Sgt.-at-Arms—Martin Hartman

The association endeavors to have interesting speakers or some blackboard discussion at each meeting.

George Boeddener, Managing Director of the National Warm Air Heating and Air Conditioning Association, was in St. Louis on March 6th and 7th to speak before the American Society of Heating and Ventilating Engineers. The St. Louis sheet metal association was invited.

An entertainment committee has been appointed and something should be cooking along that line sôon.

WALLACE CAVALLO, Secretary.

◆

Milwaukee

Milwaukee Sheet Metal Contractors Association, held at the Schroeder Hotel, March 6, 1945.—Quite a few members attended this meeting for considering and discussing The Committee's Post War Plan, the hearing of the report of our Labor Committee on their labor activities and on the indenturing of apprentices. The labor committee's report was accepted, also that of and pertaining to apprentices; the Post War Plan will receive additional attention at our ensuing April meeting. After the meeting, refreshments and good fellowship.

Paul L. Biersach, Secy.

New York State

The Compensation Insurance Group for members of the New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., calls attention of members to a bill introduced in the Senate by Mr. Bainbridge of Staten Island and its companion in the Assembly by Mr. Hatfield of Hyde Park, which prohibits direct solicitation by mail, advertising, or by paid representatives or agents for business for the State Insurance Fund.

If this bill passes, except for those employers now insured in the State Insurance Fund, the restriction of solicitation may limit the Fund to insuring in the future only those employers whose accident experience is so bad that they are refused coverage by stock or mutual insurance companies and must, by law, be covered by the Fund.

In effect, the competition of the State Insurance Fund in the field of Workmen's Compensation, which has now resulted in reduced rates by all insurance carriers and which has saved employers in New York State over 85 million dollars since the State Insurance Fund was organized pursuant to State law, would be eliminated.

The Hatfield Bill has been reported from the Assembly Labor and Industries Committee and if passed will be substituted for the companion bill of Mr. Bainbridge in the Senate.

You are urged to communicate immediately with your local Assemblyman and Senator. In addition, it is suggested that you also contact the Chairman of the Assembly Labor and Industries Committee, Frederick A. Washburn, and Senator William F. Condon, Chairman of the Senate Committee on Labor and Industry.

Refer to the bills as Senate Introductory No. 808, Bainbridge, and Assembly Introductory No. 951, Hatfield. Senators should be addressed at the Senate Chambers, Assemblymen at the Assembly Chambers, Albany, N. Y.

CLARENCE J. MEYER, Association Secretary.

◆

Wisconsin

Sheet Metal Contractors Association of Wisconsin, Board of Directors' Meeting, March 2, 1945.—A well attended meeting was called to order by President A. C. Mantei for the purpose of disposing of business accumulated during the past thirty days.

We voted unanimously to favor Natural Gas now before our State Legislature and advocate the immediate enactment of Bills Nos. 208-A and 209-A. These measures would eliminate the 7 cent tax on gas and remove prohibitive anti-natural gas legislation now part of the statutes.

An aggressive membership drive was discussed and plans suggested for the holding of our District Meetings within the law.

The usual routine business was disposed of for the best interest of the Association.

We will be on the alert when the time comes for the holding of our postponed Convention, all funds and other matter being held intact for use when that time arrives.

Paul L. Biersach was appointed a delegate to represent both local and state associations at the Sheet Metal Contractors' National Association meeting in St. Louis, April 30-May 1 and 2.

(*Continued on page* 104)

★ PENN BOILER BURNER UNITS

★ PENN FORCED WARM AIR UNITS

★ PENN HYDRO-AIRE (Split-System) UNITS

Packaged Heat by PENN

PENN BOILER and BURNER MANUFACTURING CORP.

LANCASTER, PENNSYLVANIA

Equipment Developments

For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 113 and mail to us.

△ Indicates manufacturer not listed in 1945 Directory.
• Indicates manufacturer not listed in 1945 Directory.

22—Combination Rotary

The Peck, Stow & Wilcox Company, Southington, Connecticut, announces a new PEXTO Combination Rotary Machine with interchangeable rolls for turning, burring, wiring, elbow edging and flanging operations.

The machine has a heavy one-piece enclosed frame, solid steel machine-cut quiet running gears . . . two-in-one screw gauge with knurled adjusting nut that can be applied to back of machine for burring and wiring operations and to front of machine for turning and elbow edging work . . . face of gauge polished hard-

ened steel . . . hardened steel rolls held to key-seated shafts with screw nuts eliminating the necessity of locking gears to remove rolls . . . forged steel crank for depressing top roll, independent from its screw, that can be placed in any position so as not to interfere with material . . . spring cushioned journal box and knurled lock nut with set screw for lower roll adjustment . . . steel crank that can be applied to top shaft for burring and wiring work and to lower shaft for turning, elbow edging and flanging operations, adjustable for short or long leverage for convenience of operator is attached to heavy square end shafts eliminating any possibility of crank slippage.

◆

23—Fleetweld

The Lincoln Electric Company, Cleveland 1, announces a new shielded arc electrode for general purposes welding of mild steel.

The new electrode, designated as "Fleetweld 47", offers such advantages as extremely low spatter loss, easy slag removal (most welds are practically self-cleaning), excellent re-striking characteristics, and other improved features.

"Fleetweld 47" conforms to American Welding Society electrode specifications Class E-6012 and E-6013 and may be used with either alternating or direct current. "Fleetweld 47" is especially well suited for making high speed horizontal or flat fillet welds over 4-inches long in which the coating can be dragged on both plates.

The ease of complete slag removal on square edge butt welds makes "Fleetweld 47" excellent for this type of joint. Complete penetration of ¼ in. plate can be obtained by welding one pass from each side.

This new electrode is available in the following sizes: 5/32x14; 3/16x14; ¼x18 and 5/16x18 in. The electrodes are packed in 50 pound containers.

◆

24—Large Press Brake

The Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati, has built a large two-housing press brake for the American Rolling Mill Company at Middletown, Ohio.

This press brake is capable of exerting a pressure of 1,000 tons. The

illustration shows the machine bending twenty feet of ¾-in. steel plate cold. The four main members—the bed, ram and two housings—are each the largest rolled steel plates in the world, for all practicable purposes. These plates were produced by the Luken Steel Company at Coatesville, Pa. The machine has dead weight of 250,000 pounds in round numbers.

Catalog B-2 illustrates and describes the applications of this type of machine.

◆

△25—Welding Positioner

Standard Machinery Company of Providence, Rhode Island, is introducing powered welding positioners for rotating work up to 700 lbs. at speeds from 0 to 2.4 r.p.m. in either direction by hand wheel control. The unit will accommodate table speeds up to 180-in. per minute with a work radius of 1 ft. Linear speeds at all radii are easily set and indicated on scale.

The table can be removed easily and various jigs attached directly to the spindle. The work mounted on positioner table may be tilted to any angle.

The Positioner is provided with a new built-in "Standard" Variable

Speed Transmission and hydraulic cylinder for definite power control with a single ½ hp., 110, 220 or 550-volt electric motor. Instantaneous starting, stopping and reversing is provided by a foot operated switch.

Height of the table is adjusted between 30 and 36 in. from the floor by means of its elevating screw.

The table is tilted by means of a hydraulic cylinder and gear segments. The oil pressure is developed by utilizing the gears that synchronize the disc rolls of the transmission. When not required for tilting, oil from the pump flows continuously at reduced pressure to lubricate and cool the drive roll shaft anti-friction bearings.

Tilting of the table through 135 deg. from the horizontal is controlled by a spring-centered handle which the operator moves through an angle of approximately 40 deg. in the direction of the desired table movement.

The "Standard" welding positioner is 32 in. long (without motor dimensions) 39½ in. long (overall with motor), 19 in. wide and weighs 665 lbs. The table is 28 in. in diameter, ⅝ in. thick and rotates on an elevating screw of 2 in. diameter.

LOOK TO LAU TO LEAD

in product development in this field

Everywhere one turns, there is evidence of great new things to come. While the products of American industry were being improved consistently before the war, the vast requirements and the urgency of these requirements for war have accelerated engineering and design improvements, and invention, in practically every field. It's true in the blower and fan field.

During the war, Lau has developed or assisted in the development of many very important war products—some of them highly secretive to this day. The special blowers that Lau builds for the Boeing B-29 Superfortress auxiliary power unit, for Aleutian and Russian hangar heating, for ventilation of power and radar trailer units, for refrigerated food storage units, and innumerable other purposes, have had to be engineered to meet performance tests under conditions which were unheard of, and entirely unconsidered, prior to the war. The improvements engineered into Lau Blowers for direct and indirect war applications will be available in Lau Blowers for general industrial and commercial purposes after the war.

For the present, our entire production is devoted to wartime assignments including a percentage of essential civilian orders on priority. If you are now, or in the future expect to be in the market for blowers, send us your name so we can keep you posted on these new developments as they come about.

Package Units

Blower Assemblies

Propeller Fans

Blower Wheels

THE LAU BLOWER COMPANY

DAYTON 7, OHIO, U. S. A.

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

Engineers and fabricators of general Air Handling Equipment • Single Inlet and Double Inlet Blowers • Propeller Fans • Accessories

Your postwar humidifier valve won't dribble or plug up!

—NOT IF IT'S THE NEW McDONNELL *Snap Action* FLOAT VALVE

WE won't attempt to prophesy just when you will begin to install warm air furnaces for J.Q. Public. We can assure you, however, that when you do begin to install them, you won't have to put up with dribbling, half-hearted humidifier water valves.

This assumes, of course, that you will use the new McDonnell Snap Action Float Valve. And when you consider its development and recent record, we feel sure that you *will* insist upon it for every furnace.

This valve is a complete innovation. Conventional humidifier valves slowly crack open as the float drops and merely seep or dribble water into the pan. Such action fails to flush out the valve orifice, with the result that the valve is too often plugged up with lime or dirt. The McDonnell snap action eliminates this fault. Whenever the float calls for water it snaps wide open, flushing away dirt, scale and lime, keeping the valve in good operating condition. It was a far better valve from the start and recently it has been brought to a still higher stage of perfection.

During the war this has been recognized by highest engineering authorities. Thousands of these valves in their present highly developed form have been used to control water level in special equipment used by the Army and Navy—equipment for which the designer sought the most dependable valve available.

Yes, the valve for your postwar installations has been perfected fully and proved *during* the war. Of course it is only available now for needs carrying high priority ratings.

McDONNELL & MILLER
1318 Wrigley Building, Chicago 11, Illinois

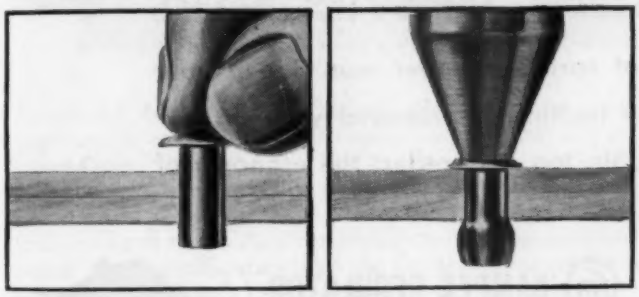
Doing One Thing Well
REG. U. S. PAT. OFF.

COPYRIGHT 1945 McDONNELL & MILLER

TOUGH RIVETING JOB ON HAND?

Check into Explosive Rivets ... they simplify riveting

Easy to use ... only 2 steps

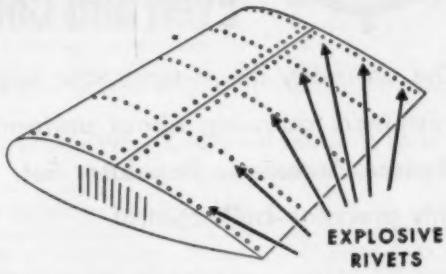


1. Insert Explosive Rivet in drilled hole.

2. Apply tip of Du Pont Riveting Iron to rivet head.

In 1½ to 2½ seconds Rivet is set and a strong, tight joint formed. No further steps are necessary. Head of the Rivet is finished when set. It's a one-man job from start to finish.

AIRCRAFT BUILDERS USE MILLIONS...



Above is shown an important aircraft application.

Leading manufacturers of airplanes are using Du Pont Explosive Rivets in scores of places to speed up the job and cut production costs. In other industries, too, Explosive Rivets have many applications in hard-to-reach spots. They solve a lot of tough riveting problems.

Where can you use these Rivets?

Have you a job of riveting in an awkward spot? If you manufacture passenger cars and trucks, radios or refrigerator cabinets, heating or ventilating equipment, household appliances or other riveted products . . . check into the advantages of Du Pont Explosive Rivets. They answer many tough riveting problems . . . permit simplified designs . . . save time and reduce costs.

Send for latest manual...

Write for "High Speed Blind Riveting with Du Pont Explosive Rivets"—a working manual chock-full of helpful data, instructions and technical information. Illustrations show typical applications . . . suggest new ways in which these Rivets can serve designers, engineers and production men. Mail convenient coupon now.

DU PONT

E. I. du Pont de Nemours & Co. (Inc.)
Explosives Department
Wilmington, Delaware

Kindly forward a copy of "High Speed Blind Riveting with Du Pont Explosive Rivets."

Name _____ *Title* _____

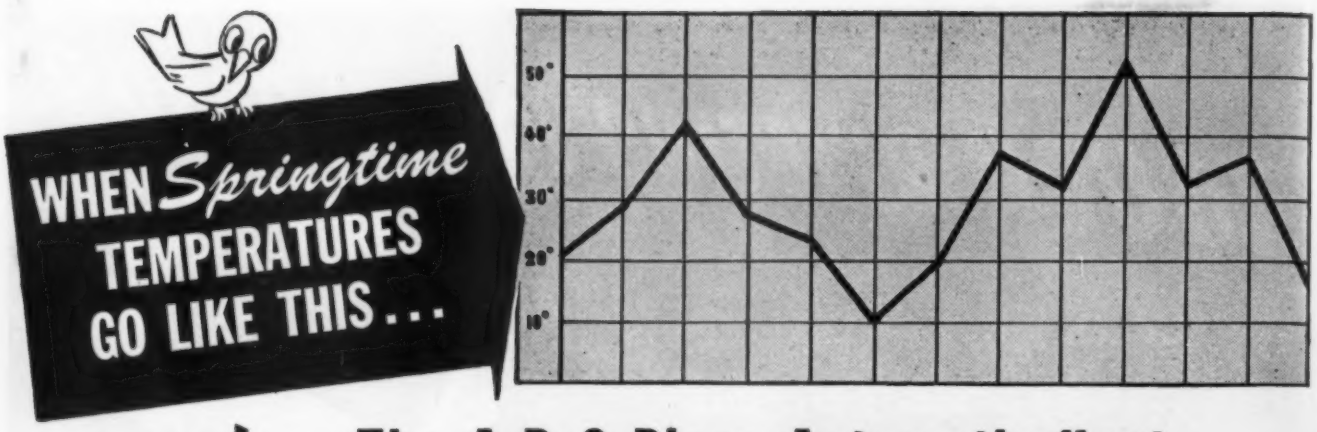
Company _____

Street _____

City _____ *Zone* ____ *State* _____

DU PONT EXPLOSIVE RIVETS

The only one-piece blind fastener



The A-P 3-Piece Automatic Heat Regulator Set Keeps Room Temperatures Even and Comfortable, Saves Fuel Dollars

The up-today down-tomorrow vagaries of spring weather won't keep your customers guessing about uniform house heating if protected with an A-P 3-piece Automatic Regulator Set. Fuel bills, too, will reflect the economy of this precision-built control.

A COMPLETE PACKAGE

— including These Exclusive A-P Features and Accessories:

MODERN WALL THERMOSTAT

— Controls room temperature to 1° above or below setting. Attractively designed—easily installed, without wall disfigurement. Cover contains accurately calibrated thermometer. Convenient manual setting controls steady heat.

LIMIT CONTROL

This practical device prevents built-up furnace heat from making the room temperature run way above the thermostat setting. Simply set dial according to season and outdoor temperature. Stops overheating and fuel waste.

DAMPER REGULATOR

A Damper Regulator Motor with exceptional lifting power. Steel gears and pinions. All electrical connections soldered carefully. Corrosion-resistant for basement installation. Motor needs no attention except once-a-year oiling.

AUTOMATIC RELATCHING — Spring latch knob on each of the two arms of Damper Regulator permit dropping of arms to close draft and check damper while stoking. Arms automatically relatch at next motor operation. A safety feature of importance.

ACCESSORIES—included in this set: Transformer, conductor cable, plated non-rusting furnace chain, cable, wires, rust-resistant pulleys, insulated staples, screws and snap links, and full instructions.

For long years of satisfactory, trouble-free service, recommend the A-P 3-piece Automatic Regulator Set. Competitively priced.

AUTOMATIC PRODUCTS COMPANY

2470-C N. THIRTY-SECOND ST. MILWAUKEE 7, WIS.

DEPENDABLE CONTROLS

FOR HEATING • AIR CONDITIONING • REFRIGERATION

Combustioneer is RIGHT on Every Count for IMMEDIATE and FUTURE Sales!

Get All the Facts About the Sales Opportunity with Combustioneer—And the Promotional and Advertising Helps Which Speed Its Sale

Automatic Coal Burning has been given a tremendous impetus by wartime curtailments and limitations on other fuels.

Every survey proves that people have the money and inclination to buy home comfort devices as never before—after the war. And no device contributes more to home comfort efficiency than the Combustioneer Automatic Coal Stoker.

Combustioneer's outstanding features of design and construction have been accredited by thousands of installations in homes, business places and industrial plants.

The Economical, Automatic Home Heating System

Combustioneer Domestic Models are bringing the luxury of automatic heat to hundreds of thousands of homes through automatically controlled, uniform temperatures, around the clock, without smoke or dirt; and *so much more heat for the money* that *Combustioneer actually pays for itself.*

Commercial Models Are In Demand for Factories, and Public and Private Buildings

Combustioneer dealers are selling industrial plants, business establishments, commercial buildings, schools and institutions, the dollar saving services of Combustioneer in *drastically reducing fuel cost, increasing the output* of existing boilers and maintaining closely held temperatures automatically with less labor and supervision time.

Learn Why Combustioneer Is First Choice For Immediate and Future Sales

You are entitled to all the facts about Combustioneer's 28 years of continuing design, engineering and manufacturing leadership. You should know how it is precision-made completely in one modern plant. You will want to get the evidence of Combustioneer's dependability as proved by the statements of users everywhere. You can get all these facts and more, by asking for complete details about the Combustioneer franchise. It offers you a proved precision-built product that fits like a glove into your post-war merchandising picture. Write or wire without delay.

COMBUSTIONEER GIVES YOU EVERY ADVERTISING AND PROMTIONAL HELP TO MAKE IT EASY FOR YOU TO SELL

Combustioneer supplies complete visual presentation materials which are effectively bulwarked by:

1. Continuous national advertising.
2. Effective localized advertising campaigns.
3. Sales-making literature and mat service.
4. Regular promotional plans.
5. Window and store display materials.
6. Comprehensive sales and service manuals.

HOME AND COMMERCIAL MODELS FOR EVERY NEED

In addition to Imperial and Bin Feed Models which serve homes from six rooms to duplex and small apartments up to 14 rooms, Combustioneer's complete line of Commercial Models range in coal burning capacity from 75 to 1200 lbs. per hour.

Combustioneer

AUTOMATIC COAL BURNER

THE STEEL PRODUCTS ENGINEERING CO.
1201 W. COLUMBIA ST. SPRINGFIELD, OHIO

KEEP ON BUYING WAR BONDS

William B. McKenzie

Power City Radio Company
Sioux Falls, South Dakota

Places High Value On Coleman Oil Heater Franchise:

"Coleman Leadership In Quality ..Promotion..Cooperation..Make Franchise Valuable To Us!"

"We can never stop shouting our praises for Coleman. Our Coleman Heating Equipment Franchise is most highly valued. The Coleman Company seems to have an unusual sense of loyal and sincere cooperation. We especially appreciate the fine cooperation received from Coleman fieldmen and the unexcelled promotion and display material and assistance. The Coleman Heaters are superior in quality and performance, and we can see big things for Coleman and their outlets in the post-war period."

Coleman franchise dealers are being appointed now by America's leading distributors for post-war sales of these Coleman Heating Appliance lines: Oil Heaters; GAS, OIL and LP-gas Floor Furnaces, Water Heaters, and Central Heat Plants. This franchise is awarded to aggressive dealers who can qualify and handle the volume of Coleman business they can easily develop. Write us for the name of your Coleman distributor, who can tell you the complete story of the Coleman opportunity in the waiting billion-dollar home-heating market. Coleman Lamp and Stove Co., Dept. AA-36X, Wichita 1, Kansas.

THE "HOT" NAME IN HOME HEATING

Coleman

THE COLEMAN LAMP AND STOVE COMPANY • WICHITA 1 • CHICAGO 11 • PHILADELPHIA 8 • LOS ANGELES 54 • TORONTO, CANADA

CHRYSLER AIRTEMP

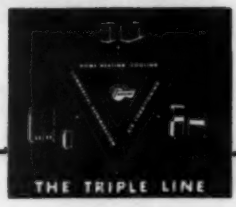
SPECTROSCOPIC TEST OF METAL PROPERTIES

Engineered for Performance

Expert engineering is the foundation upon which Chrysler Airtemp quality is built. Careful attention to engineering details—accompanied by modern mass production methods—has given Chrysler Airtemp an enviable reputation for both quality and lasting performance in temperature-humidity control products.

The complete line of heating equipment incorporates new, compact designs using all types of fuel. "Packaged" cooling units, pioneered by Chrysler Airtemp and the commercial refrigeration equipment measure up to the same high standards.

The Chrysler Airtemp Triple Line . . . Heating, Cooling, and Commercial Refrigeration . . . offers heating dealers a very unusual opportunity for 12 months' profitable operation. Remember, direct dealer agreements will be available for any single Chrysler Airtemp Line . . . any two lines . . . or for all three lines. • Airtemp Division of Chrysler Corporation, Dayton 1, Ohio.



THE 4 FUNDAMENTALS of CHRYSLER AIRTEMP DEALER OPERATIONS

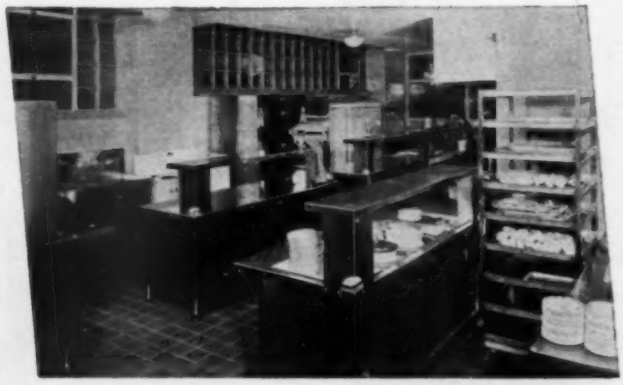
1. Engineered Installation
2. Proper Display
3. Outside Selling
4. Customer Service

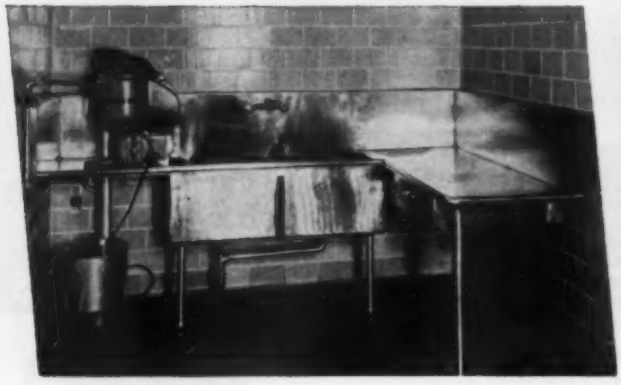
L.C.I.

Buy More War Bonds! Tune in Major Bowes every Thursday, CBS, 9 p. m., E. W. T.

HEATING • COOLING • REFRIGERATION

No other metal ... is more sanitary, durable, easy to clean!





Any sheet metal fabricator would be proud of this stainless steel equipment—now saving time, trouble and money for a big Cleveland hospital.

After the war, when this bright rustless metal again becomes plentiful, you too can make good profits, and give your customers lasting satisfaction, with ARMCO Stainless construction.

You can tell prospects that no other metal is more sanitary, durable and easy to keep clean. Wash-ups require less time because dirt and grease don't take to its dense, smooth surface. Upkeep is no problem because there is no wear-out or rust-out to stainless.

You can readily shear, work, weld and solder ARMCO Stainless steel. And it gives you a lot of pride and satisfaction when you see your jobs ready for long years of faithful, low-cost service.

Keep in touch with the ARMCO Stainless Distributor and he'll tell you when this money-making metal is ready for your skilful work. The American Rolling Mill Company, 541 Curtis Street, Middletown, Ohio.

STAINLESS ARMCO STEEL

WHEN HE SAYS

I think I can sell

GAS HEATING!

Be ready to check his ability through the Bryant Sales Talent Indicator Plan

It has been in careful preparation for many months . . . the Bryant Sales Talent Indicator Plan that now is ready to help guide you in the selection of your gas heating sales staff!

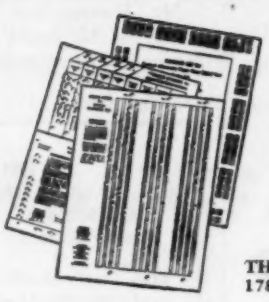
Created by the famed Personnel Research Institute of Western Reserve University, under the direction of Dr. Jay L. Otis, this plan is specifically designed to uncover for you the men best fitted to sell gas heating.

Not limiting a final judgment to any one form of test, it checks applicants from all possible approaches. *A weighted application blank* produces basic employment data. *A regulated interview and rating chart* reveals personal characteristics and work history. *A salesman classification test* determines the applicant's trainability. Then, *the Bryant Sales Talent Indicator,* key test of the plan, indicates in 20 minutes whether the applicant has the sales characteristics required in a successful gas heating salesman. And, if your type of selling also requires *mechanical aptitude,* there is a supplementary test to measure this ability.

Plan now to learn the details of this tested sales personnel selection plan, and how it can help you. Set a date for the Bryant representative to make a personal presentation in your office.

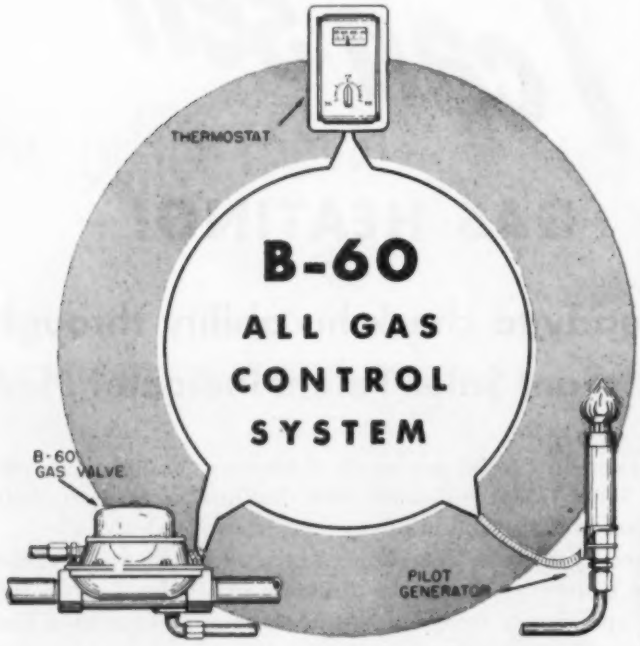
bryant
GAS
HEATING

LET THE PUP BE FURNACE MAN



THE BRYANT HEATER COMPANY
17825 St. Clair Ave., Cleveland 10, Ohio
One of the Dresser Industries

GENERAL CONTROLS



A completely self-contained and self-operating system, consisting of a T-80 Series Trimtherm Thermostat, a B-60 Gas Valve and a Pilot Generator. No outside current is needed.

PILOT GENERATOR—This ingenious device is an exclusive General Controls development. Designed on the thermocouple principle, the Pilot Generator supplies all necessary current for operation of the B-60 Gas Valve.

T-80 TRIMTHERM—Trimtherm's modern, streamlined appearance and advanced engineering design, make it a universal choice for accurate, remote control of room temperature.

B-60 GAS VALVE—Compact. Tamper-proof cover. Integral pilot valve assembly. Extremely strong valve body. Increased seating pressure, maximum capacities. Locked binding posts prevent turning.

For further information, contact your nearest General Controls factory branch or distributor, or write for Catalog 52-B.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

BRANCHES: ATLANTA • BOSTON • CHICAGO • KANSAS CITY • DALLAS • DENVER • DETROIT • HOUSTON
PHILADELPHIA • NEW YORK • CLEVELAND • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

Association Activities . . .

(*Continued from page* 92)

PFMA Elects 1945 Officers

The Propeller Fan Manufacturers Association held their annual meeting on Wednesday, February 21, 1945, at the Hotel Statler in St. Louis, Missouri.

The meeting was well attended and all sections of the country was represented.

The following officers were elected to serve during the year of 1945:

H. M. Guilbert, B. F. Sturtevant Company, President.
E. C. Englert, Hartzell Propeller Fan Co., Vice-President.
V. C. Shetler, 2-255 General Motors Bldg., Detroit 2, Michigan, Sec'y-Treas.

PFMA wishes to report that during this meeting it was emphatically brought forth that our industry has been, and is doing everything possible to win this war.

We will have more to say about our Certified Ratings on fans for civilian use after we get things settled and get our boys back home. We have every indication to believe that these Certified Ratings have played an important part in the war program.

◆

I.C.I. Chapter for Hartford, Conn.

More than 60 representatives of heating and allied interests attended an organization meeting in the auditorium of the Hartford Gas Company in Hartford, Conn., on March 13 to discuss plans for forming a local chapter of the Indoor Climate Institute.

After an explanation of the purpose and aims of ICI, a show of hands indicated a large percentage present interested in forming a Hartford chapter. Edward C. Marsden, temporary chairman, said he would appoint an organization committee of ten or twelve to be announced later, the committee to report at another meeting to be held early in April.

◆

Wisconsin Honors Biersach

A large number of sheet metal contractors representing Racine, Madison, Waukesha and Milwaukee County gathered on April 3rd at the Club Room, Hotel Schroeder, Milwaukee, to honor Secretary Paul L. Biersach—secretary for the past thirty years and in the industry since 1889. President A. E. Winkler opened the meeting by advising those present that there would be no business during the evening. A dozen members lauded the performance, work and efforts during the past years and then all partook of a luncheon and refreshments. Margy and her accordion entertained, followed by card games until midnight.

◆

C. F. Malone, 1414 Iowa Street, Davenport, Iowa, and Mrs. Malone celebrated their 50th wedding anniversary on April 8, 1945.

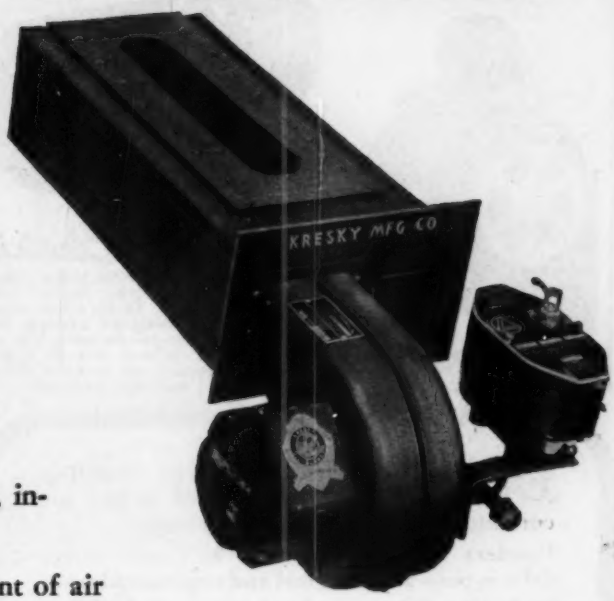
Mr. Malone has represented International Heater Company for 35 years in Illinois, Iowa and part of Missouri. He has always made his headquarters at Davenport.

Important Meetings

Apr. 30-May 1—Sheet Metal Contractors National Association. Board of Directors Meeting. Melbourne Hotel, St. Louis. Clarence J. Meyer, National Secretary, Buffalo 4, N. Y.

May 18-19—Roofing & Sheet Metal Contractors Association of Florida. Angelbilt Hotel, Orlando. Fred A. Falkner, President, c/o Falkner, Inc., P. O. Box 673, Orlando, Florida.

KRESKY OIL BURNERS



They Suit because They're Sootless!

Kresky Oil Burners deliver a long, clean, extra hot flame that is smoke-free and therefore soot-free. They do it because:

1. They induct air into the fire mechanically, instead of depending on natural draft.
2. They introduce exactly the right amount of air in the right way to produce maximum combustion—thanks to the exclusive Kresky design.

An Active Line for Active Distributors

With the Kresky Burner as the basic sales feature, Kresky produces a full line of Floor Furnaces, Space Heaters, Basement Furnaces, Hot Water Heaters and Conversion Burners adaptable to a wide variety of oil burning appliances. If you're interested in a well varied line with nearly 40 years of leadership in its field, write for full particulars.

KRESKY MANUFACTURING CO.

Pioneers in Oil Burning Equipment Since 1910

PETALUMA CALIFORNIA

USE
Peerless Electric
BLOWER ASSEMBLIES
in your
FURNACES and CABINETS

TWO TYPES
BOTH Peerless Electric

Belt drive assemblies with either top or rear mounted motor—with resilient bases to prevent vibration. Direct drive assemblies use specially-designed Peerless Electric capacitor motors—exceptionally efficient and quiet. Blower wheels, directly connected to motor, are forward curved, dynamically and statically balanced.

ELIMINATE service worries by installing Peerless Electric blowers for winter air conditioning and forced air heating.

Peerless Electric blowers—belt and direct drive types—are designed and engineered from more than 50 years of experience in building quality motors and electrical apparatus. Peerless Electric equipment is complete—manufactured entirely in our own modern plant—*not an assembled line*—and priced right, offering bigger profits to you.

Write for detailed information.

DIRECT DRIVE
Peerless Electric
AIRBOY PACKAGE UNIT

Delivers 850 cfm, sufficient for a house of approximately 10,000 cu. ft.; 3-speed motor with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced; a very compact unit. The two motor bearings are the *only* bearings in the unit.

THE Peerless ELECTRIC COMPANY
WARREN, OHIO
Established 1893

Engineering Schools

(*Continued from page* 91)

Considerable interest was manifested in one of Luxaire's postwar air conditioning gas-fired units, particularly in the case of erection, installation and simplicity of servicing. In connection with the companies' postwar plans, Mr. Hayes stressed the tremendous potential market of the Cleveland area both for new heating equipment and replacements. To meet this demand he emphasized that Luxaire and Moncrief plan to offer the latest in all types of heating equipment.

Mr. Hayes also states that it is planned to hold additional schools in other parts of the country as soon as conditions permit.

The three-day session closed with a banquet after which the group was addressed by President C. A. Olsen, who enthusiastically outlined and summed up the postwar plans of the Luxaire and Moncrief organizations.

◆

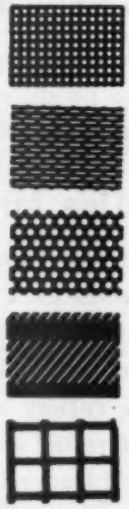
Honeywell School for Heating Industry

Minneapolis-Honeywell Regulator Company, Minneapolis 8, has undertaken a large educational program in the heating industry—a nationwide school for all individuals associated with automatic heating.

In preparation for more than a year, the "school" will be open to dealers, wholesalers, manufacturers, vocational schools, electricians, steamfitters, sheet metal workers and any others interested in heating, C. B. Sweatt, vice president, announces. There will be no charge.

In planning the course, the company also had in mind the rehabilitation of men of the armed forces who, by prior experience, or by choice, want to find jobs in some

PERFORATED METALS
ARE ESSENTIAL



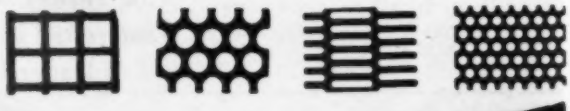
They are used in the processing of grain, food, chemicals, ore, coal, rubber, petroleum and many other products.

—

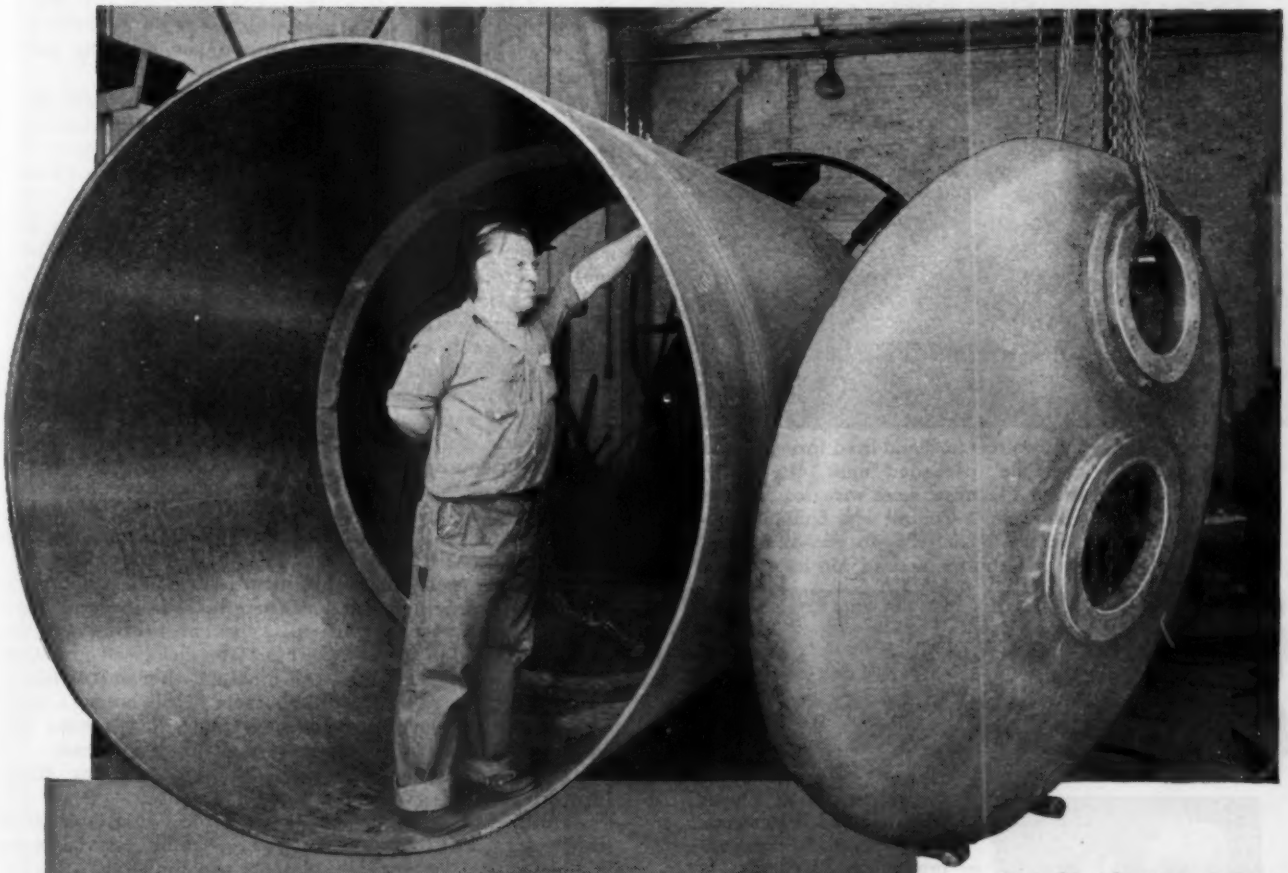
Our range of sizes is great and we aim to meet the most exacting demands.

—

Write us for information.



The Harrington & King PERFORATING CO.
5649 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.



3½-ton COPPER Plate saves 200 MAN HOURS...

One of two large pressure vessels of the same size for use in manufacture of synthetic rubber. Shell is formed of single copper plate, weighing 7,292 pounds. The plate was rolled in the Detroit mill of The American Brass Company and the vessel was fabricated by The Vulcan Copper & Supply Company of Cincinnati, Ohio.

A SINGLE ANACONDA copper plate ⅝ inch thick, 22 feet 10½ inches long by 11 feet 2⅝ inches wide, and weighing 7,292 pounds, one of the largest ever rolled by any brass or copper mill, forms the body of this large pressure vessel. Through the use of a single plate, the fabricator, The Vulcan Copper & Supply Company, saved an estimated 200 man-hours of labor.

The top head was formed from a copper circle ¾ inch thick and 9 feet ¾ inch in diameter, weighing 2,243 pounds. The circle for the bottom head was 8 feet 6 inches in diameter, ¾ inch thick, and weighed 1,964 pounds.

Both the longitudinal seam of the body and the top and bottom heads were oxy-acetylene welded with Anaconda Silver Bearing Copper 110 Rod.

Anaconda Metals . . . copper, brass, bronze . . . have always provided the chemical and process industries with materials high in corrosion resistance, ductility, strength and thermal conductivity. The availability of large plates and advancements in welding practice open new fields of usefulness for copper and copper-base alloys.

4521

BUY WAR BONDS . . . Buy all you can . . . Keep all you buy

ANACONDA

Anaconda Copper

THE AMERICAN BRASS COMPANY—General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

Sampsel Coal Saving Controls for hand-fired furnaces and boilers come in complete, packaged units, No. 8873, shown above, consists of a Sampsel three wire, low voltage Thermostat, a Sampsel Damper Control with built-in transformer, a Sampsel Warm Air Limit Control and all chains, pulleys, wire, hooks and screws needed for installation.

Quality maintained

No. 8870. This unit includes Sampsel Standard Thermostat, Sampsel Damper Motor and all accessories.

● During these times when tremendous demands are being made upon our production facilities to meet the need for Sampsel Coal Saving Controls, the Sampsel policy of fine workmanship and thorough, individual inspection is being strictly maintained. You can be *sure* of Sampsel Quality.

Design improved

No. 8871 includes Damper Control, Sampsel Day-Night Dual Thermostat Electric clock and accessories. No. 8874 adds a limit control.

● Sampsel Controls are a fitting complement to the modern home of today — and tomorrow! These units, beautifully finished in ivory, represent a distinct step forward in heating accessories. Their outstanding performance is reflected by their attractive and appealing designs.

Sampsel
AUTOMATIC CONTROLS

Sampsel Time Control, Inc., Spring Valley, Ill.

phase of the heating industry. The program also will be of considerable help to fathers who are training their sons to carry on in the businesses built up over a long period of years.

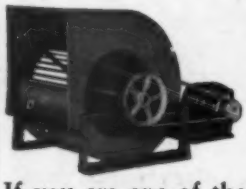
The courses started May first, and will be held in all sections of the United States where company branches are maintained ,and when a sufficient number of people indicate a desire to enroll. Schools have been held in Chicago (on April 4) and New York (on April 11).

Prepared by Honeywell technicians in cooperation with a company specializing in visual education, the complete course extends for four 2½ hour meetings. More than 800 slides, many of them in color, are used, while simple but complete lectures fill in the details. The company has had considerable experience in visual education techniques. More than 3,000 members of the Army, Navy and Marine Air Forces have gone through a Honeywell school to teach operation of some of the electronic control equipment developed and being made for the armed services of the United States and Allied Nations. The schools will be conducted by company sales-engineers who have been specially trained for the purpose. There are twenty-one complete sets of material so that twenty-one schools can be run in various parts of the country simultaneously.

Primary purpose of the program is to teach the application of automatic controls and their installation and maintenance in connection with all types of heating systems using all kinds of fuel. Subjects to be discussed are: Control identification, circuits, thermostats, thermostat installation, limit controls, relays, controls of oil burners, summer-winter systems, oil burner systems, gas burner control systems, stoker systems, hand-fired systems, unit heater systems, zone controls, Weatherstat systems, Moduflow, and installation helps and service tips.

Enrollment cards for the courses are available from wholesalers, utilities, manufacturers, trade and vocational schools and other organizations in the industry.

PROPER SELECTION IS IMPORTANT!



The selection of the right blower for forced air heating is essential to the continued success of the equipment. Air-conditioning equipment cannot render fully satisfactory service unless it is correctly "blowered."

If you are one of the manufacturers who have equipped your forced air heating units with REX BLOWERS you already know of their quality and dependability. And performance is the proof of good blowers—insuring that they are well designed and sturdily made for continuous, trouble-free, top service.

Over fifteen years of experience with forced air heating equipment backed by forty years of appliance manufacturing has prepared our engineering department to improve the sales and service value of the units you make, sponsor or sell. Avail yourself of this service.

Write for catalog No. 228 on REX Air-Pak Blower Filter Units for conversion work and catalog No. 222 for REX Blowers for forced air furnaces.

Air Controls Inc
Div. of
The Cleveland Heater Co.

2301 Superior Avenue Cleveland 14, Ohio
Pioneer Blower Manufacturers

WE'D LIKE TO PIN A MEDAL ON YOUR CHEST!

You sure deserve a citation for the swell job you've been doing in keeping old heating equipment in operation. It's a genuine contribution to the war effort! And you've been doing a real job, too, in conserving fuel, by servicing SUNBEAM Warm Air Equipment so it will continue to perform just as efficiently and economically as when it was new.

Don't stop now! We urge you to continue the canvass of homeowners in your neighborhood. It isn't a bit too early to get their heating plants in condition for next winter. It will mean extra income for you — and prospects for replacement once our production of SUNBEAM Warm Air Furnaces and Winter Air Conditioners can be resumed.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

SUNBEAM

repair parts now available

Good news right now is that your SUNBEAM wholesaler can supply you with genuine SUNBEAM repair parts. Check with him when you start your spring servicing.

• • •

Our plans do not call for or contemplate any change in our pre-war method of distribution of SUNBEAM *products.*

AMERICAN RADIATOR & Standard Sanitary

New York CORPORATION Pittsburgh

These Things We Pledge Ourselves To Do — For the Post-War Success of the Independent Furnace Dealer

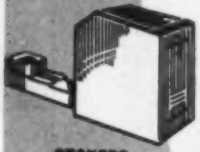
CAST IRON FURNACES

STEEL FURNACES

WINTER AIR CONDITIONERS

OIL BURNERS

BLOWERS



STOKERS

HUMIDIFIERS

- Premier equipment is and will be sold through Independent Furnace Dealers under an attactive program that safeguards the dealer now and in the future.
- Every Premier dealer will receive exclusive territory protection.
- Every Premier dealer will receive effective selling, advertising, and engineering helps direct from the factory.
- Every Premier dealer will have the assistance of a factory trained field engineer.
- Every Premier dealer will have the advantage of a complete line of home-comfort equipment including systems for warm air heating, air conditioning, automatic fuel burning and cooling.
- Every Premier dealer will know he is fully protected against unfair competition because we will not sell to any other dealer in the territory assigned to him.

Inquire now about the Premier Post-War Franchise

PREMIER Furnace Co.
Dowagiac, Michigan

Also:
COOLING EQUIPMENT
REGISTERS
DUCTWORK
AUTOMATIC CONTROLS

PREMIER
The Year 'Round Line

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 113.

129—Dampers, Regulators, Controls

The Young Regulator Company, 5209 Euclid Avenue, Cleveland 3, is distributing Catalog No. 3 entitled "Damper Regulators, Remote Control Dampers, By-Pass Dampers" for factories, hotels, hospitals, ships, schools, churches, office buildings and residences.

Illustrated and described are the Young damper regulator, concealed damper regulator, flush cup damper regulator, Valcalox damper regulator, remote control damper regulators, dampers for use with remote control regulators, relief and fresh air dampers, and air-split damper regulators.

◆

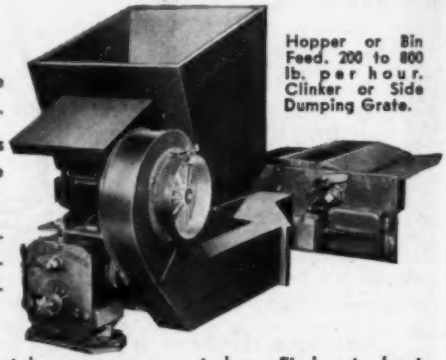
130—Health Hazards in Soldering

L. B. Allen Co., Inc., 6719 Bryn Mawr Ave., Chicago 31, Illinois, is distributing reprints from "The Illinois Labor Bulletin" entitled "Health Hazards in Soldering Operations." No. 1 is a "Survey of Hazards Created by the Various Types of Soldering and Practical Control Methods" and No. 2 is entitled "Machine Soldering—in the Can Industry the Use of Tin Conserving Solders Has Intensified the Hazard of Lead Poisoning."

Also available are charts entitled How to Solder; Melting Points of Solder; How to Solder Stainless Steel; How to Solder Cast Iron; How to Solder Aluminum; Vibration Resistance to Solder; Tensile Strength of Solder; How to Solder Stainless Steel Pipe Joints; Feet per Pound, Various Solder Alloys, and Gauges.

3 REASONS WHY
THE *IMPROVED* FREDERICK STOKER
SAVES FUEL . . . SAVES TIME . . . SAVES MONEY

1. The fuly active grate surface . .
2. Continuous speed type transmission . .
3. Completely enclosed windboxes and mechanism.



Hopper or Bin Feed. 200 to 800 lb. per hour. Clinker or Side Dumping Grate.

Send for our stoker catalog . . . today. Find out about Frederick engineered features which give maximum combustion efficiency with minimum service and maintenance . . . and result in lowered fuel consumption.

Remember Frederick . . . when in the market for Centrifugal Pumps. For over 25 years Frederick has been designing and manufacturing pumps for efficient service in your industry . . . guaranteed to meet the operating conditions for which they are sold. Engineering consultation available without obligation.

THE *Frederick* IRON & STEEL CO.
Frederick, Maryland

STOKER SPECIALISTS SINCE 1918

Let the TORIDHEET Line help you to Business Happiness!

We can't adjust your taxes, furnish you with salesmen, operate your office with efficiency or do your banking. But we *can* furnish a line of *modern* heating equipment that can help bring happiness into your business operation if you supply initiative, energy and salesmanship.

What do we mean? *Happiness* in business comes largely from ability to find customers and supply them with an extra good product at a fair price. This makes for quick sales—at low sales cost—with a reasonable profit.

How does Toridheet help you to this business happiness?

1. **Toridheet products** are engineered, designed and made the efficient way in our own plants.
2. **Toridheet products** have demonstrated their positive economy and efficiency; have earned a national reputation for dependability and low service cost.
3. **Toridheet complete line,** under one trade name enables Toridheet dealers to meet almost any residential heating requirement. Postwar line will include: Two types of Oil Burners, Air-Conditioning Units, Oil-Burner Boilers, Coal Furnaces, Gas Furnaces, Oil Water Heaters.

Oil Burners and Oil-Burning Boilers, available now!

4. **Toridheet units** are shipped as package units, complete and ready for installation, with least expenditure of manhours.
5. **Toridheet policies** are known and recognized as liberal, fair, helpful and protective to its dealers. Prices unblushingly competitive.

These facts are important to you. If you would like to know *how* important suppose you get in touch with us and learn how Toridheet may help you to real business happiness.

MEMBER OBI OIL BURNER INSTITUTE

BUY WAR BONDS . . . AND HOLD THEM

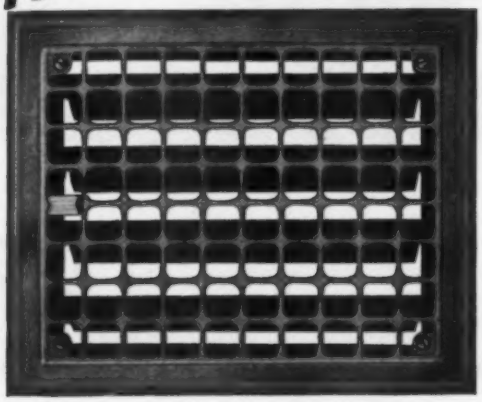
TORIDHEET DIVISION

CLEVELAND STEEL PRODUCTS CORP. • CLEVELAND 2, OHIO

Oil Burners • Air Conditioning Units • Oil-Burner Boilers
Coal and Gas Furnaces • Oil Water Heaters

CLASS 200

STEEL FLOOR REGISTERS



Again in Production *for YOUR Benefit!*

Yes, our Class 200 Steel Floor Registers will temporarily supplant our Class 210 "NO-FLEX" Floor Registers. And here in brief is the sole reason: Because of the difference in processing, we can manufacture five to six times as many Class 200 registers as Class 210 in any given period of time. With the demand for floor registers far in excess of the number we can produce with the current manpower shortage, reversion to Class 200 will enable us to furnish five to six times the quantity of much needed floor registers which would be available if we were to confine production to Class 210 exclusively.

H&C No. 200 is a quality register in every detail and we believe the trade will heartily approve our effort to thus furnish as great a proportion as possible of their Floor Register requirements.

FOR BEST SERVICE . . . on all registers, order in conformity with Bulletin S-95 which lists all items now being manufactured. Standard sizes listed for Class 200 are as follows: 6 x 8, 8 x 10, 8 x 12, 9 x 12, 10 x 12, 10 x 14, 12 x 14. Other sizes listed in Bulletin S-95 will be furnished in Class 210.

Ask your jobber or write us for copy of Bulletin S-95 if you do not have one. See Catalog No. 42 for details of registers and accessories.

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 113.

131—New Rating Formula

The Front Rank Furnace Co., Div. of Liberty Foundry Co., 2500 Ohio Ave., St. Louis, calls attention in the March, 1945, "Firing Line" to the new rating formula adopted by the National Warm Air Heating & Air Condition Association for gravity and forced air furnaces, and includes a table of the new ratings as applied to Front Rank furnaces.

◆

132—Additional Technical Data

Stoker Manufacturers' Association, 307 North Michigan avenue, Chicago 1, announces a four-page folder containing a consolidated table on the factors for the selection of stoker equipment as reprinted from the new engineering handbook available in separate form entitled "Consolidated Table—Load Carrying Capacities; Minimum Furnace Dimensions; Draft and Chimneys for Typical Single Retort Underfeed Stokers; Explanatory Notes."

This table, together with explanatory notes, contains essential and basic engineering and technical data covering load carrying capacities of various size stokers ranging from 15 to 1200 lbs. of coal per hour and the Association's recommendations as to setting heights, boiler and furnace minimum widths and lengths, together with condensed data on chimney sizes. It is a four-page folder, 8½x11, and punched for loose-leaf forms or reference books. Single copies are available at 5c per copy.

Premier FURNACE CLEANER

BUILDS UP SERVICE VOLUME!

The sturdy Premier Furnace and Boiler Cleaner works as your best ally in developing service business *in volume*—it gives you first-hand knowledge of needed repairs while it brings you profits on cleaning jobs! It's rugged and powerful, yet compact and light weight—easily carried and operated by one man. Write today for complete information.

NEW IMPROVED MODELS

Completely Equipped

½ H.P. . . $74.50

1 H.P. . . $89.50

ELECTRIC VACUUM CLEANER CO., INC.

1730 Ivanhoe Rd. • Cleveland, O.

New Literature

For your convenience in obtaining copies of New Literature use the coupon on this page.

133—Seam and Roll Spot Welding

Sciaky Bros., 4915 West 67th Street, Chicago, is distributing a new Sciaky Bulletin No. 113-A describing their series PMM-1 180 KVA seam welder for mild steels, stainless and non-ferrous alloys. General information and tooling data are included in addition to actual machine specifications.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

22	23	24	25	
129	130	131	132	133

Name .....

Company .....

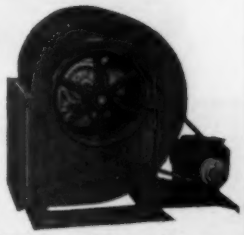
Address .....

Are you Manufacturer——Jobber——Dealer——

YOUR BLOWER Requirements

AVAILABLE AT

Schwitzer-Cummins Company



★ BLOWERS FOR EVERY PURPOSE

Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.

★ CENTER DISC WHEEL—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

★ ENGINEERING DATA—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
1145 EAST 22ND STREET INDIANAPOLIS, U. S. A.

If you are developing new post-war *fans, blowers,* or other *air conditioning* equipment—it will pay you to investigate

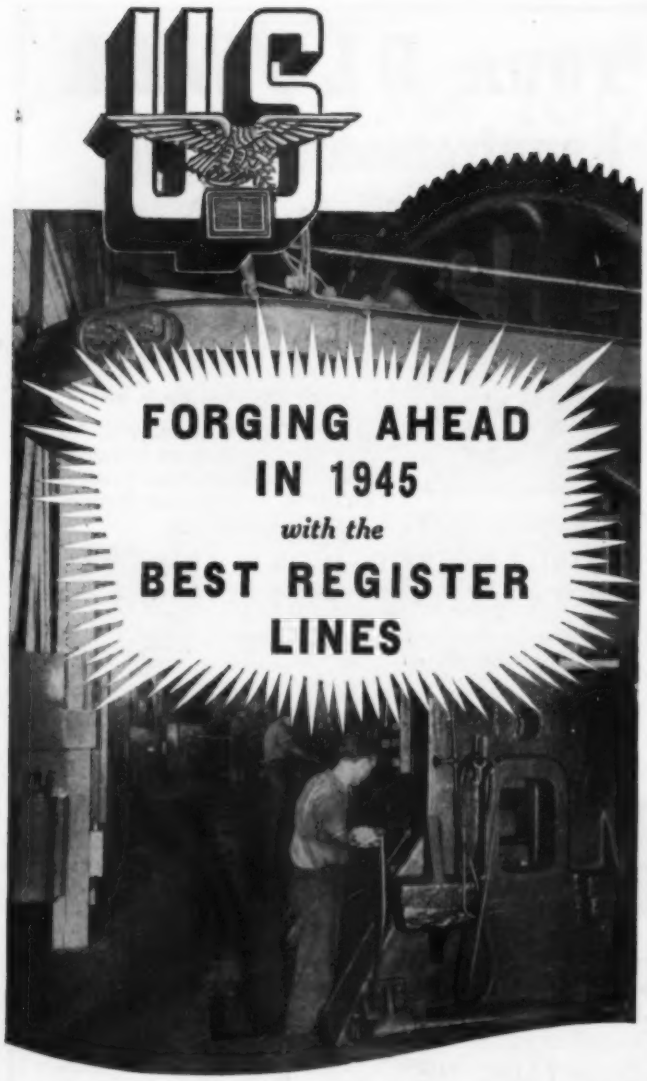
TRIANGLE BEARINGS

Shock-Absorbing Pillow Blocks

They are silent—vibrationless—self-lubricated—scientifically streamlined for compactness, simplicity, strength and minimum obstruction to air flow.

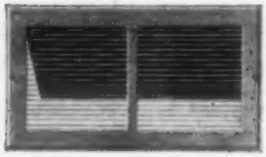
Write for samples and complete information

TRIANGLE MANUFACTURING CO.
392 DIVISION STREET OSHKOSH, WISCONSIN



NO. 40 U.S. GRAVITY BASEBOARD REGISTERS

Pre-War Prices—Same Superior Qualities of Material, Workmanship, and Styles



NO. 153 U.S. AIR CONDITIONING REGISTERS

Single Valve — Pre-War Prices Prevail — Sufficiently competitive for the Lowest Cost House. Attractive and Efficient for the Most Costly Home or Structure.

We wish to impress our Trade that the Same Quality Superior to other Lines, Still Prevails—No Synthetic Substitute has been introduced in U.S. Register Production—Yet PRE-WAR PRICES Still Prevail.

Write for Latest 1945 *Price Lists—*41*AC and* 41*G Catalogs.*

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

With the Manufacturers

Donald S. Woods

Al Shields, General Sales Manager of the **Evanair Division of the Evans' Products Company,** 15310 Fullerton Ave., Detroit, makers of the Evanair line of home heating equipment, announces the appointment of **Donald S. Woods,** to be in charge of sales of the Evanair furnace and water heater section.

Mr. Woods came to the Evans organization from the War Production Board where for more than a year he was Chief of the Plumbing and Heating Branch of the Office of Civilian Requirements. Prior to that he was technical advisor on plumbing and heating for the National Housing Agency.

◆

Peerless Foundry Needs Equipment

The Peerless Foundry Company, Inc., 1845 Ludlow Ave., Indianapolis 7, Indiana, experienced a disastrous fire in February, but are back in production with a portion of their plant and making some deliveries. If any reader has any of the following equipment not now being used, it may help Peerless Foundry procure some good used equipment without waiting for the priority system which will tie them up for many months:

Angle Iron Roll—⅜ inch and heavier
Press Brake—8 foot, for ¼ Plate
Tablast on Tumblast for cleaning castings
American Sand Cutter
Heavy Duty Steel Shelving

Readers wishing to dispose of any of the above equipment should communicate with The Peerless Foundry Company directly.

WAYNE HOME EQUIPMENT

DISTRIBUTOR – DEALER
PARTNERSHIP PLAN

- **Complete line of Home Equipment.**
- **Broad advertising program.**
- **Selling helps that SELL.**

MODEL "O"
A New High Efficiency Pressure-Type OIL BURNER for new homes, replacements and conversions. Priced for the volume market.

YOU MAKE GREATER PROFITS IN THE
POPULAR PRICE RANGE

WAYNE OIL BURNER COMPANY—FORT WAYNE 4, INDIANA
Another New Unit Will Be Featured Next Month. Watch for it.

With the Manufacturers

Milcor (Canton) Moves to Cleveland

Effective April 2, 1945, the entire Milcor operation at Canton, Ohio, was moved to Cleveland. In that city Milcor manufacturing and sales will be co-ordinated with those of The J. M. & L. A. Osborn Co., which was recently purchased by the Milcor Steel Company.

The complete Milcor line heretofore produced and distributed from the Canton plant will henceforth be handled through the Osborn plant and offices—in addition to the Osborn line as previously carried.

The revised name of the company is The J. M. & L. A. Osborn Co., Division of Milcor Steel Company, 1541 East 38th Street, Cleveland 14, Ohio. Other Osborn warehouses at Buffalo, Detroit and Cincinnati will also be in a position to handle Milcor materials.

The new officers, as determined by a recent election, are as follows:

E. A. Tanner, Chairman of the Board
G. F. Climo, President
C. E. Caddy, Vice President
G. W. Hillibish, Vice President
E. L. Lipman, Secretary and Treasurer
C. C. Bolus Ass't Secretary and Ass't Treasurer

Don L. Rossiter, formerly District Sales Manager of Milcor at Canton, is going to Cleveland as general manager of sales of the Osborn Company. Jos. T. Hagan will remain at Cleveland as district sales manager of that territory. Carl T. Howe and A. E. Kirchgraber remain as district sales managers of the Osborn Cincinnati and Buffalo warehouses. Carl F. Gruenert is the new district sales manager of the Osborn warehouse at Detroit.

◆

Mott Bros. Company, wholesalers of Rockford, Illinois, announces with profound sorrow the death of **J. H. Ryerson**, beloved associate of the company, on February 9th.

HEAD-ACHE'S END
When you use THARCO
ASBESTOS FURNACE CEMENT

Yes, when you use Tharco Asbestos Furnace Cement you know your job is going to really stand up because Tharco is a stand-up product. Made from the finest materials, by an exclusive Armstrong formula and processed to just the right, easy working consistency for quick, smooth application. Tharco gives longest service under toughest conditions. Put an end to furnace cement headaches . . . make your repair jobs and your new jobs give greatest customer satisfaction . . . use Tharco Asbestos Furnace Cement for best results. Write for a copy of, "The Proper Use and Care of Furnace Cement." It will save you time and money.

THARCO
Asbestos Furnace Cement
THE ARMSTRONG COMPANY

"Use CLARAGE PRODUCTS and Repeat Business Comes Easy!"

This nationally known, nationally accepted fan equipment helps you land desirable jobs—helps you KEEP desirable customers. It will pay to figure with us on any air handling or conditioning project. *Write for catalog covering complete Clarage line of fans, blowers, unit heaters, coolers and conditioning units.*

FURNACE FANS

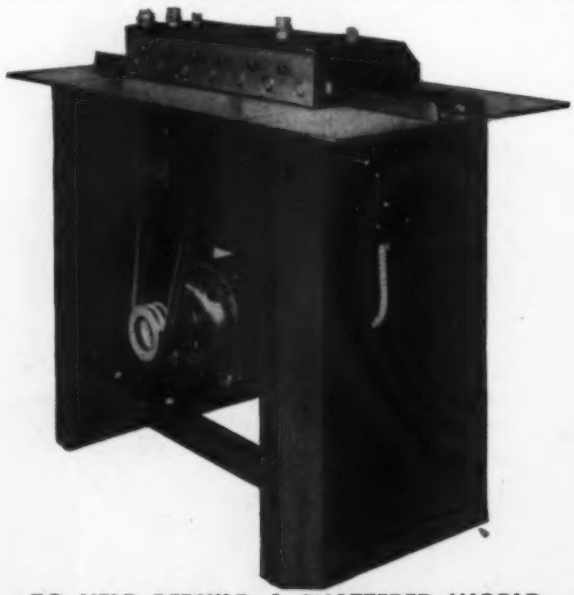
UNIT HEATERS

EXHAUST FANS

ARMY (E) NAVY

COMPLETE AIR CONDITIONING • COOLING • VENTILATION • FACTORY HEATING • MECHANICAL DRAFT • FANS and BLOWERS for INDUSTRIAL NEEDS

Clarage Fan Company Kalamazoo, Mich.
APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



TO HELP REBUILD A SHATTERED WORLD

In the feverish energy of post war days—when speed is important, and economy is vital—look to Lockformer lock-rolling machines to save time and money.

Lockformers *do* speed up work amazingly. Lockformer 16, shown here, for example, makes Pittsburgh locks, double seam locks, drive cleats, right angle flanges and standing seam locks—in an astonishingly short time.

More Lockformers are now in use than all other makes of lock-rolling machines combined.

THE LOCKFORMER CO.

4615 Arthington Street, Chicago 44, Illinois

With the Manufacturers

New General Controls Expansion

General Controls Co., Glendale, Calif., manufacturer of electro-magnetic control valves, announces the completion of another step in an expansion program that will soon put three acres of factory space under roof. The immediate expansion includes a processing plant, with 10,000 sq. ft. of space, in which heat treating, anodizing, mechanical deburring, sand blasting and painting departments are housed.

In addition, a new, modern office building will soon be ready for occupancy. This building, which embodies several innovations in design and construction, measures 235x45 ft., and will house the executive offices, the administrative, sales, advertising and sales promotion departments. Upon completion, this move will make available an additional 10,000 ft. of badly needed factory production space.

While General Controls Co. is engaged almost entirely in essential war production, and will be for the duration, it is planning and building for a permanent post-war future.—W. A. Ray, President.

◆

Hohmeyer of Detroit Lubricator

E. J. Doucet, general sales manager, **Detroit, Lubricator Company**, 5900 Trumbull Avenue, Detroit 8, announces the appointment of **W. H. Hohmeyer** as manager of the oil burner controls division effective April 1, 1945, to succeed **F. G. Coggin**, who becomes manager of the Company's Refrigeration Division.

Mr. Hohmeyer has been associated with the Company for the past 18 years, and for the past three years has been advertising manager.

There's an **AIRTHERM Direct Fired Unit Heater in a Size to Heat Your Plant Efficiently, Economically • •**

The Airtherm Direct Fired Unit Heater is made in 6 sizes, from 300,000 to 1,700,000 BTU, to assure you efficient, uniform heat regardless of your floor plan. It spreads heat evenly as far away as 200 feet. The Airtherm can be installed in just a few hours without costly duct work, radiators, or pipes.

Airtherm Direct Fired Unit Heaters have reduced heating costs in many plants in which they have been installed. Let us work with you in planning efficient heat for your plant. Write today for bulletin describing the complete line of Airtherm Direct Fired Unit Heaters.

AIRTHERM
MANUFACTURING COMPANY
706 South Spring Avenue • Saint Louis 10, Missouri

Amendments Interpretations

(*Continued from page* 68)

Order L-228 as amended March 5 prohibits the manufacture of two lightweight roofing products formerly permitted, and makes specifications for two other types more definite. The order limits manufacture of asphalt and tarred roofing products and asphalt shingles to those specified in Schedule A.

Types removed from Schedule A are smooth surface roll roofing (Type 4, Grade B or C), and cap sheet (Type 7). These types are of such low grade that they do not meet Federal specifications or the tests of fire underwriters. In general, they are not acceptable for military requirements or for lend-lease use. Specification changes in saturated and coated felt builtup roofing products (Types 5 and 6) reduce the maximum permissible finished weight, and specify the minimum dry felt weight instead of leaving it optional, as heretofore.

◆

Stoker Situation

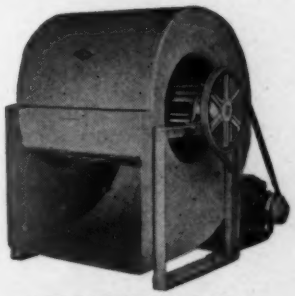
THE stoker situation is summarized by Stoker Manufacturers Ass'n as follows:

A survey shows manufacturers were at least 15,000 orders behind on Class A stokers. Taking into consideration the production of Class A's in March and the orders which will be received by April 1st, every

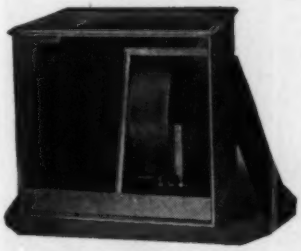
Properaire ●
AIR MOVING EQUIPMENT

BLOWERS
EXHAUSTERS
FANS

for Homes
Stores
Offices
Factories
Institutions



"B" ASSEMBLY Belt Drive

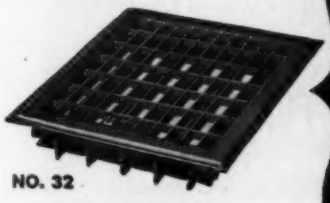


SERIES 2000
Insulated Package Units

TYPE E
Direct Drive

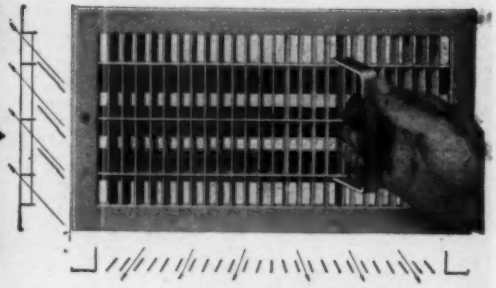
Ask your Jobber to write for "Blower File" FREE

GRAND RAPIDS DIE & TOOL CO.
1202 Godfrey Ave., S. W., Grand Rapids 2, Mich.



NO. 32

INDEPENDENT
"Fabrikated"
REGISTERS • GRILLES
COLD AIR FACES



NO. 321A

ALWAYS LEADING—ALWAYS PROGRESSING

● Only products of proved dependability can attain leadership. The quality of INDEPENDENT "FABRIKATED" Grilles and Cold Air Faces is backed by 46 years of manufacturing experience in the register field.

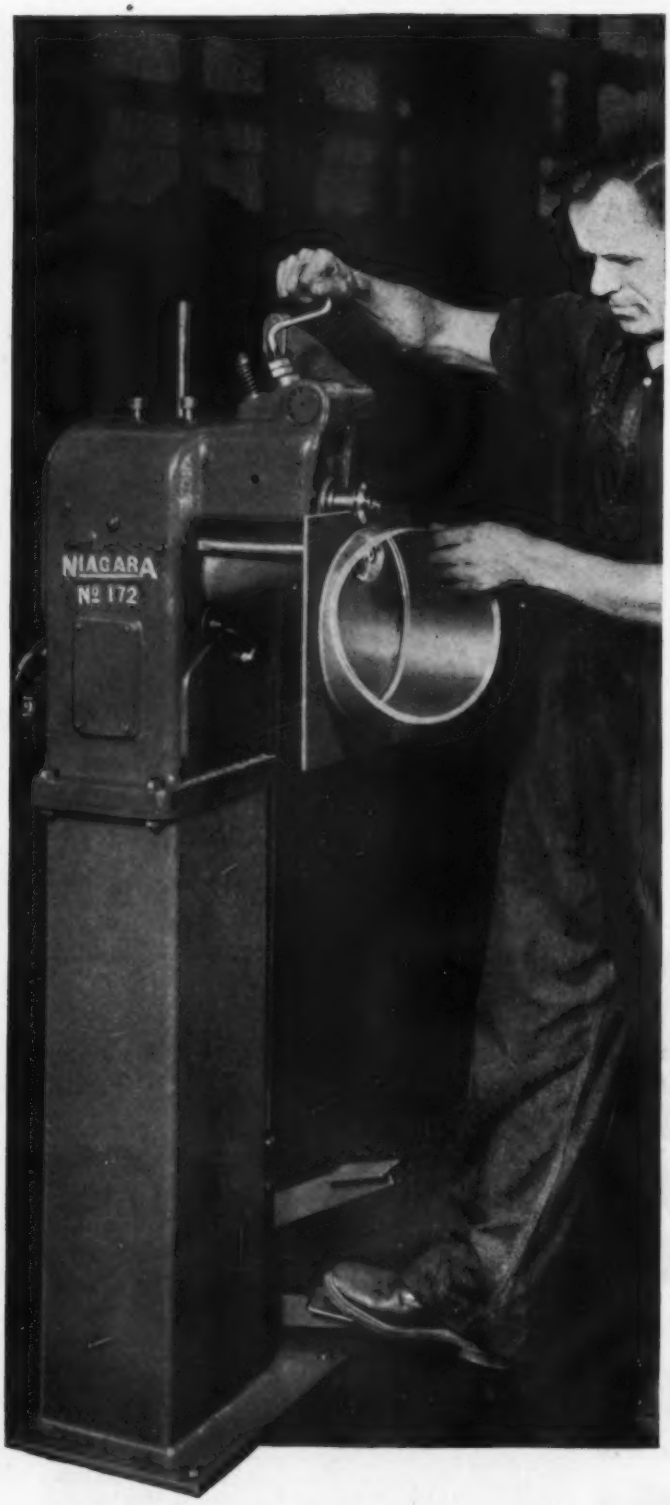
Join the parade to greater post-Victory profits by concentrating on the extensive INDEPENDENT line to meet all requirements for air conditioning and warm air heating registers, cold air faces and grilles—all from one source of proved dependability.

No. 32, illustrated, is a "Fabrikated" register with multiple valves for use in the floor in furnace installations.

No. 321A wall grille with deflecting vanes is a directed air flow "Fabrikated" grille with bars that can be adjusted individually to direct air flow to the right, left or fanwise, as illustrated. Horizontal deflecting vanes in back may be individually adjusted to give upward or downward deflection of air flow.

Send for catalog showing the wide variety of the complete INDEPENDENT line with many improved exclusive features.

THE INDEPENDENT REGISTER CO.
3747 EAST 93RD STREET, CLEVELAND, OHIO



This motor driven Niagara Combination Machine with interchangeable rolls offers the modern sheet metal worker power operation and high output. No longer necessary to hold and guide the work with one hand while the other turns the crank.

One machine performs Burring, Turning, Wiring, Beading, Crimping, Elbow Edging, Slitting and other operations. Write for Bulletin 75-A. Niagara Machine & Tool Works, General Offices and Factory, 637-697 Northland Ave., Buffalo, N. Y. District Offices: New York, Cleveland, Detroit.

indication is that we will go into the second quarter with a large number of unfilled orders on hand—at least 15,000 units.

The production quota and allotment for the first quarter of this year is for 14,000 Class A stokers. The quota for the second quarter is 10,000 Class A stokers —a reduction of 4,000 units, yet the industry will still have orders for approximately 15,000 stokers to fill. Production quotas and authorizations for the third and fourth quarters have not yet been determined.

In the face of the conditions mentioned WPB is cutting back allotments of carbon steel and other materials for the second quarter thus creating the almost certain possibility that Class A stoker production alone will be held to the barest minimum.

So far this year and in fact since the Industry was permitted to resume the manufacture of Class B's last fall, there has been only an extremely limited number of Class B's produced. It has been recommended to WPB by the Advisory Committee that all manufacturers of both Class A and Class B stokers immediately re-arrange their production plans and schedules to concentrate on the manufacture of Class A stokers and only the largest size of Class B stoker in each company's particular line.

This does not mean to say that those manufacturers who have a limited quantity of Class B stokers in process should cease production of these machines.

In connection with first quarter 1945 production, any manufacturer who fails to produce the quota of Class A stokers allotted for that quarter, may carry over up to 10 per cent of this production into the second quarter without penalty on second quarter production.

CASH FOR CLEANING
CITATION FOR CONSERVATION

Due to the present shortage of fuel and replacement parts, furnaces must be cleaned thoroughly and efficiently to guard against possible breakdowns or unnecessary waste.

The Doyle Vac-It is designed to give your customers top quality servicing. Sturdily built from the finest materials available, the Vac-It does the job right — quickly eliminating soot or other flue travel "plug-up" conditions. Result: Increased profits through increased business and a citation for assuring efficient furnace operation and conserving vital fuel!

Write for complete information today!

Doyle VAC-IT

DOYLE VACUUM CLEANER CO., 227 Stevens St., S.W., Grand Rapids 7, Mich.

On Our Industry's Front

(*Continued from page* 58)

sor stations on the Tennessee Gas and Transmission Co., pipeline from Monroe, La., to West Virginia. These additional stations, to be built near Greenville, Miss.; Middleton and Springfield, Tenn., and Frenchburg, Ky., will make possible the delivery of an additional 60,000,000 cubic feet of gas daily into the Appalachian area. Cost of the four stations is estimated at $5,000,000.

The other project involves construction of approximately 140 miles of 24-inch pipeline by the United Gas Pipeline Co., at a cost of $7,000,000 from the Carthage Gas Field in Texas to the Tennessee Gas and Transmission Co., line at Monroe. This line is necessary to assure the additional deliverability on the T.G. and T. line as well as strengthen the deliverability of gas on other major pipelines out of the Monroe field serving southeastern United States.

Both projects are scheduled for completion by November 1, 1945.

In February OWU authorized an AA-1 priority for construction work to expand the capacity of a Panhandle Eastern Pipeline Co., pipeline from the Hugoton gas field in the Southwest to the Ohio-Michigan area by 50,000,000 cubic feet daily. The two new projects bring to 110,000,000 cubic feet of gas the amount of additional daily delivery into the Appalachian area planned for next winter.

Order from PEERLESS

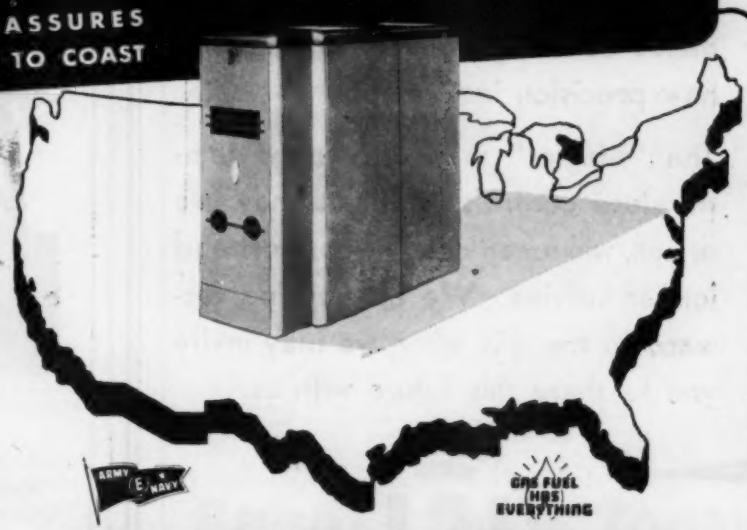
• Your requirements for complete warm air heating needs—including Steel furnaces—*repair parts for all makes of furnaces and boilers.* Fittings, registers, blowers, asbestos paper, electric controls, etc. Orders will be filled as rapidly as present conditions will permit.

PEERLESS FOUNDRY COMPANY

1855 Ludlow Ave. Indianapolis 7, Ind.

Payne ZONEAIR

PRE-WAR PERFORMANCE ASSURES POST-WAR PREFERENCE — COAST TO COAST



Building load for gas companies, sales for heating dealers . . . and good will for both . . . PAYNE gas furnaces have been associated with advanced design and engineering leadership for 30 years. ★ Post-war models will be improved, of course . . . but gradually, soundly, and only after exhaustive tests. And they will be ideally adapted to . . .

Payne
ZONE-CONDITIONING

. . . a progressive development of the time-tried PAYNE "Unit" heating system: Winter air-conditioning and cooling summer ventilation, *controlled by zones or rooms.* Write for new ZONE-CONDITIONING booklet.

ARMY E NAVY

GAS FUEL HAS EVERYTHING

PAYNEHEAT

30 YEARS OF LEADERSHIP

Payne FURNACE & SUPPLY CO., INC., BEVERLY HILLS, CALIFORNIA

MASTER
TEMPERATURE CONTROLS

Ready To Go Ahead When The War Job Is Done

Our engineers, mechanics and management brought to our war jobs the successful experience of more than a quarter of a century in the making of precision temperature controls. It was gratifying to have this war work confirm our faith in our ability to meet the most exacting requirements.

During these war-busy years, we have learned much — and we shall carry over this increased initiative and skill into civilian production in the future. Without detracting from our war effort, we have planned for post-war progress . . . worked out improvements in our products and devised new precision instruments.

The "Master" mark on future temperature controls, that you may use or sell, will mean greater comfort and longer service. We are looking forward to the day when we may invite you to share this future with us.

MEMBER I.C.I. INDOOR CLIMATE INSTITUTE

WHITE MANUFACTURING CO.
2369 University Avenue St. Paul, Minnesota

More FHA Money

THE Federal Housing Administration has notified its field offices to resume issuance of commitments to insure loans on houses built for war workers.

The FHA action was in accord with Congressional approval of an amendment to the Act which extends its war housing insurance powers until July 1, 1946, and added $100,000,000 to its Title VI authorization.

Congress, in passing the amendment, raised the total FHA Title VI insurance authorization from $1,700,000,000 to $1,800,000,000 and thus makes possible, it was estimated, the construction of nearly 22,000 additional privately-financed dwelling units urgently needed for war workers. About 16,000 of these already have been programmed by the National Housing Agency.

◆

Deferment Gets Tough

NEW regulations just issued by the national Selective Service headquarters will add to the difficulties of firms who attempt to obtain continued deferments for repairmen. By terms of a new regulation issued Feb. 24, men up to the age of 34 will have to meet more rigid requirements to be eligible for occupational deferments. It declared that registrants of such age to be eligible for deferment must be *"necessary to* and regularly engaged in" an activity in war production or in support of the national health, safety, or interest. Before, the only requirement was that registrants in this age group, to be eligible for deferment, must be "regularly engaged in" an activity

Barth
U. S. A.

A NEW FORMING ROLL
4 inch - No. 3842

Modern design with gearing completely enclosed. These BARTH Forming Rolls are furnished in 2 in., 2½ in., 3 in. and 4 in. rolls with lengths from 30 inches to 48 inches. All have slip roll features.

Complete information furnished on request.

THE BARTH MANUFACTURING CO.
MILLDALE, CONN.

in support of the national health, safety, and interest or in an activity in war production. The memorandum to local boards also said that "if all other factors are equal, a father should be given greater consideration for occupational deferment than a non-father in this age group."

With reference to registrants age 34 through 37, the memorandum says that "merely the determination is required that the registrant is 'regularly engaged in' an activity in war production or in support of the national health, safety, or public interest."

At the same time, announcement was made of the details of the plan approved by the Office of War Mobilization covering the procedure for deferment of a limited number of men under 30 years of age. It is understood that for the time being at least, this will constitute the principal means of obtaining deferments for all men under 30.

According to the memorandum to local boards, "the prospect for registrants 18 through 29 is that they will be inducted unless the information submitted to local boards by employers indicates that they are necessary to and regularly engaged in, *and that they are indispensable and irreplaceable* in an activity in war production or in support of the national health, safety, and interest."

Employers will file a new form 42-A Special Revised (replacing the former 42-A Special) to the appropriate agency of the Federal Government for certification or denial of certification.

The agency which would handle the certifications for "furnace repairmen and engineers," according to information presently available, is the Office of Civilian Requirements of the War Production Board.

To each of the 15 Federal agencies is allowed certifi-

ATTENTION CONTRACTORS:

Make a profitable business of installing Vitroliner Vent Pipe in old or new masonry chimneys for long life and PROTECTION. Ideal for gas or oil fired jobs where CONDENSATION is an important problem.

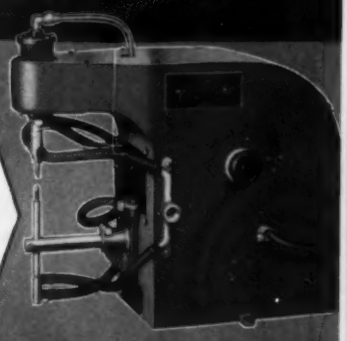
VITROLINER CHIMNEY LINER is heavy gauge, high quality enameling stock iron and is coated inside and out with special high temperature acid-resisting vitreous enamel. Bell and Spigot type joint assures a perfect and uniform fit.

Vitroliner Vent Pipe is easy to install in a few hours. Write for details to

CONDENSATION ENGINEERING CORPORATION

122 S. Michigan Ave. Chicago 3, Illinois

Can you set 100 Rivets *in 1 Minute?*



NEW

MIDGET AUTOMATIC

Precision Type SPOT WELDER

with "built-in" Electronic timer

Now you can join metal surfaces many times faster than ever before with this new-type low cost resistance welder. You may speed production as much as 12 or 15 times, and get cleaner, better joints than ever before. And the exclusive "built-in" timer will let you eliminate completely the human element of error. No more operator fatigue, and now, even "green" help can do high quality work.

LOWEST PRICED AUTOMATIC MACHINE ON THE MARKET

No other air-operated welder is available today at this amazingly low price of $350 with a built-in Electronic Timer, and solenoid valve controls. The Universal Midget Automatic is the only bench type machine with water-cooled transformer, electrodes and tips.

Look

AT THESE RESULTS

Compare these results of a simple tear test of a weld made with the Universal Midget Automatic. You will note that the weld nugget held, and only the parent metal gave. Write today and learn how this amazing machine can make money for you.

SEE THE UNIVERSAL MIDGET AUTOMATIC AT THESE DEALERS

Cincinnati Machinery & Supply.....Cincinnati, Ohio
McDonald Machinery Co.....St. Louis, Mo.
Machinery & Supplies Co.....Kansas City, Mo.
American Machinery & Supplies Co.....Omaha, Neb.
Globe Machinery & Supply.....Des Moines, Iowa
Rex Welder Sales Co.....Cleveland, Ohio
F. W. Burns Machinery Co.....Milwaukee, Wisconsin
Interstate Machinery Co.....Chicago, Illinois

Send Coupon Today

UNIVERSAL POWER CORP., 4920-B EUCLID AVE.
CLEVELAND 3, OHIO

Please send full details at no cost on your Midget Automatic Welder and how it can help me.

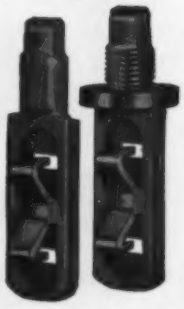
NAME .....

ADDRESS .....

CITY..... STATE.....

HERE'S HOW TO WIN FRIENDS AND PLEASE CUSTOMERS

Help Furnace Users Save Precious Fuel by Installing E-Z-ON DAMPER Regulators



SMOOTHER OPERATING, rattle-free damper installations result from the use of E-Z-ON Damper Regulators—stepping up the heating efficiency of the furnace, saving money by reducing coal consumption.

E-Z-ON Damper Regulators — standard or "snap-tite" types — are stocked and recommended by your jobber. Profit by using them.

M. A. GERETT CORPORATION
724 WEST WINNEBAGO STREET · MILWAUKEE 5, WISCONSIN

cation of a flat 30 percent in their respective spheres of activity. In most cases, one 15 percent is being delegated to the field offices of the agency, and the other 15 percent is being retained in Washington.

Selective Service headquarters points out that employers seeking deferment of key men under the age of 30 might file the new form with the local board even though certification has been denied by the Federal agency having jurisdiction.

Local boards have the power to grant or deny the deferment request on their own judgment of the facts, but boards have been instructed to give certified requests "the most serious consideration."

◆

Remedy for Cold Floors

(*Continued from page* 73)

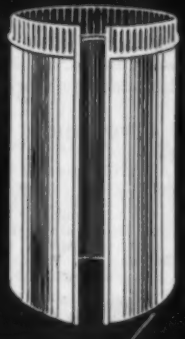
change at the floor line drastically before this change builds up to the five foot point so as to operate the thermostat.

You must cycle a burner frequently. By putting the thermostat low you have reached the point in the room of most rapid temperature change and, therefore, you will cycle your burner more frequently and smooth out the temperature regulation much better. In the first one of these Chicago jobs changed a test was run when outside temperature averaged 25° to 30°. The limit control was set down to cut off the burner at about 135°. The combination of the low location for the thermostat and the low setting for the limit control caused the burner to come on and run about two minutes and then be off from four to

CHAR-GALE

● Because they're already engineered to save you time and trouble, you can make extra profits with Char-Gale "Pre-fabricated" Ducts and Fittings. Made by standard mass production methods . . . all sizes are accurate . . . no delays on the job. Try us on your next installation.

Pre-Fabricated DUCTS *and* FITTINGS

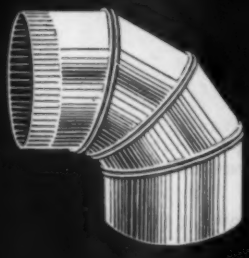


SMOKE PIPE

◀ Backed by years of experience, the Char-Gale double offset lock gives continuous satisfaction.

ELBOWS

Easy to adjust . . . extra ▶ large segments . . . won't come apart. Char-Gale elbows are trustworthy.



PRE-FABRICATED AIR DUCTS

▲ The "quick-method" chart in the Char-Gale catalog gives accurate sizes for any job, and figures costs for you. Send for it.

CHAR-GALE MANUFACTURING CO.

CATALOG NO. 40

For complete information on smoke and stove pipe, elbows, warm and cold air pipe, registers and air filters write CHAR-GALE Mfg. Co., 3125 Hiawatha Ave., Minneapolis 6, Minn.

eight minutes and come on again for about two minutes and then go off. The blower ran continuously, of course. It was this type of operation that produced a heating result that simply amazed the occupants of that home.

Unfortunately, there are still too many dealers who are continuing to set blower controls to shut off the blower at anywhere from 110° to 135°.

Too many forced warm air plants installed in the past five years are not producing the beautiful heating results that a forced air job is capable of if the blower runs continuously in weather colder than 35° to 40° with the burner cycling very frequently.

◆

Neubecker—4 Branches From a Square Duct

(*Continued from page* 74)

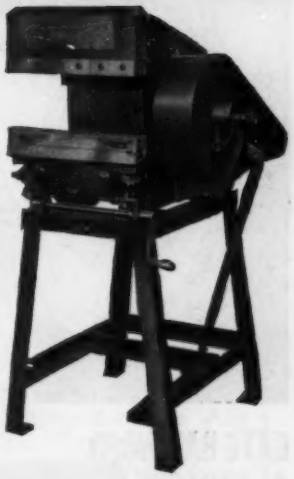
to *B - 4* in the true lengths. Now with radii equal to *B - 5*, *B - 6* and *B - 7°* in the true lengths and using *B* in pattern as center describe short arcs near *5*, *6* and *7*. Again set the dividers equal to the divisions between *4* and *7* in the semi-circle in elevation and starting from *4* in the pattern intersect arcs *5*, *6* and *7* and draw a line from *7* to *B*.

With B^x -B^v in plan as radius (which equals one half the width of the square duct or 7⅛ inches) and using *B* in the pattern as center, draw a short arc near *B°*, which intersect by an arc struck from *7* as center, with a radius equal to *7° - B* in elevation, (the true length of the seam line). Draw lines in the pat-

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

18" PRESS BRAKE

CAPACITY 14 GA. IRON
47 STROKES PER MIN.



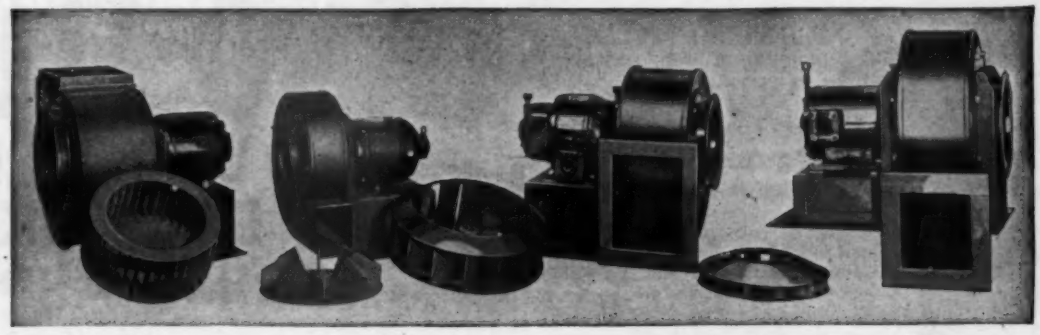
Specially designed to meet the need for a small power-driven press brake for moderate-sized work in jobbing and production shops. Specifications include 1" length of stroke, 1" adjustment, 1 h.p. motor, 11½" throat height, 6¼" throat depth. Ram and die shoes are machined to take standard ½" tongues. Powerful, extremely sturdy, fast, easy to adjust, accurate, with many practical features.

NO. 5 JR. PUNCH

A handy tool for all sheet metal workers. Capacity ¼" hole in 16 ga. iron. Will punch in center of 4" disc. In metal kit box complete with 7 punches and dies.

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

Johnson **FANS AND BLOWERS** *improved by continuous research*



★ **Johnson Health-aire Propeller Fans and Blowers of various types are now available for industrial and commercial users. And back of every one of these products is the cumulative "know-how" growing out of more than twenty-five years of constant research, experiment, improvement, perfection. New units were created and added to the expanding line to keep pace with every modern requirement. Johnson engineers have solved literally thousands of ventilating and air-handling problems—their counsel is available to you at all times to help produce "climate as you like it."**.

*BLOWERS (above) available from 6" to 50".

JOHNSON FAN & BLOWER CORP. • 1319 W. Lake Street, Chicago, 7, Illinois

THE FACTS ABOUT THE field

ROCKER TYPE FULCRUM

This design — the action of the old rocking chair — means less friction. Less friction means greater accuracy, greater sensitivity, no binding, no oiling, nor corrosion and years of trouble free operation. The hinge pin rolls in slots, instead of twisting in journals.

OFF CENTER GATE MOUNTING

This mounting — coupled with *side wings* — provides greater sensitivity and greater accuracy. Barometric pressure operates on a greater effective area; the side wings increase the air opening more uniformly, more accurately compensating for each barometric change.

EXTENDED HOUSING

This design places the gate — even in wide open position — outside the flow of gases from the heating unit. Thus the Field Control is not readily fouled by soot, nor will the gate warp from heat. This means longer operating life — no service calls — uniform regulation.

field

CONTROL DIVISION

OF H. D. CONKEY & COMPANY, MENDOTA, ILLINOIS

tern from *B* to *B°* to *7* and trace a curved line from *1* to *4* to *7* as shown. Then will *1 - 7 - B° - B - A - 7* be the one half net pattern shape.

If the branch pattern is desired in one piece, then reverse the half pattern opposite the line *A - 1* as explained on the drawing. To the full pattern shape add the width of the desired collar indicated in elevation and allow laps for either seaming or riveting. In forming the branches make slight bends on the solid lines in patterns and carefully round out the curves *1 - 4 - A* and *4 - 7 - B* down to the apex *A* and *B* respectfully so as to represent one quarter cones.

◆

"Streamlined"
Financial Accounting

(*Continued from page* 55)

There is no mystery about the preparation of the profit and loss statement. List your costs and expenses and deduct them from sales to get the profit. With the exception of inventory, balance sheet accounts do not enter into profit and loss computation or cost accounting. This statement shows actual income and outgo, hence actual costs, but the figures are not arranged to provide costing data on jobs. For one thing, the time element is not shown, and this is an important factor in job costing. Then again, the

SNO-FLUF
COOLER PADS and EXCELSIOR of PRIME ASPEN

Direct from the forest, to the factory, to you

A source of constant business: your cooler customers must have their evaporative coolers repacked each year, and this is the perfect excelsior for the job! Accurately shredded and tested to 93% cooler efficiency. Sold in pads, bales or smaller handy bales. For folder and prices, write the

Palmer Manufacturing Corp.
Phoenix, Arizona

materials needed for a certain type job are not indicated on the profit and loss statement.

If a contractor costs his jobs by the labor-hour method, he must have a knowledge of the time it takes to do a job and the profit and loss statement offers him nothing here. If he uses the mark-up on cost or margin on sales method, he must use certain ratios to arrive at the selling price. These ratios may be found on the profit and loss statement. They are average figures, which are better than no figures at all, but they are often misleading when used as a basis for costing. For example, if a man has three sons, age 2, 17 and 20, or 39 years in all, you would not be much enlightened as to their respective ages if he told you that they averaged 13 years.

Current Costs Give True Ratios

Likewise with job costs. On different types of jobs costs often differ widely and unless you have some means of determining the costs per type of job you won't do a good costing job. If you use average costs as shown on the profit and loss statement ratios, you may often go wrong. Moreover, many contractors make out profit and loss statements only yearly and use these ratios when costing subsequent estimates, overlooking the fact that the percentages are a year old when used. If costs did not change from year to year, this would be Okeh, but even in so-called normal times costs do not stay put this long. In these hectic war days and in the equally hectic postwar tomorrow, a contractor who works on ratios supplied by old profit and loss statements cannot hope to cost jobs accurately.

ATH-A-NOR
Furnace Repair Parts

The furnace choice of dealers who know performance and saleability has been Ath-A-Nor for more than 50 years. Quality, economy and efficiency have always distinguished the Ath-A-Nor line. Replace with Ath-A-Nor to insure maximum performance and fuel economy! And continue to pile up scrap for munitions and see that it reaches government agencies speedily!

MAY-FIEBEGER COMPANY
MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS
NEWARK, OHIO

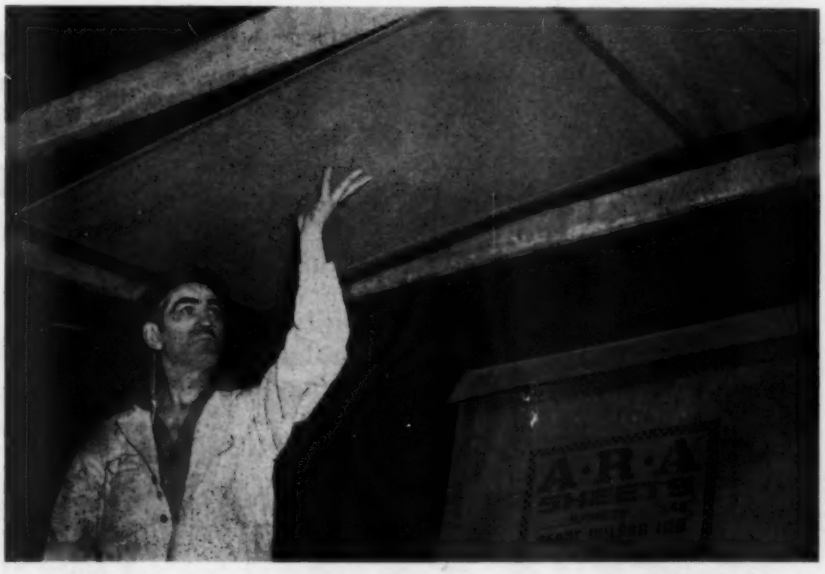
A FULL AND UNLIMITED SUBSTITUTE FOR SHEET STEEL IN THE HEATING AND VENTILATING FIELD

A.R.A. Sheets lend themselves to easy fabrication in your own shop into sturdy ducts, smooth, strong, round pipe and intricate, complicated fittings.

This sheet has been tested, approved and pronounced the most satisfactory and safest sheet of its kind.

Asbestos clad A.R.A. Sheets are tough yet flexible—rigid but not brittle—fireproofed and water-proofed—will not dry out, crack, crumble, or chip, have a high insulating value (K. 45 B.T.U.) and good sound-deadening properties.

Here is the package of A.R.A. Sheets that make it the most convenient sheet to ship, stock or carry on the job. The Sheets are always clean and in good condition.



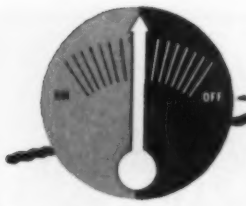
A.R.A. Sheets weigh only about one-half pound per square foot. The advantage of this lightness in weight is valuable in many ways. An A.R.A. Sheet is easy to handle because it is a "one man" sheet.

Get Genuine A.R.A. Sheets from Your Jobber!

Write today for 16-page illustrated booklet No. 89-A which describes the many outstanding features that are possible only in A.R.A. Sheets.

GRANT WILSON, INC.
141 WEST JACKSON BLVD., CHICAGO 4, ILLINOIS

You can depend on every square foot of A.R.A. Sheets as being uniform and of the highest quality.



"TURN IT ON—TURN IT OFF" TIME IS HERE AGAIN

EASY AS 1-2-3 WITH A REZNOR UNIT HEATER

★

Cold today, warm tomorrow. Now you want heat, now you don't. Central heating systems do not turn off or on at will. For intermittent operation, large heating plants not only are inefficient but costly and unsatisfactory. You can turn on a Gas-Fired Reznor and start a flow of heat or turn it off and stop the flow . . . all in a matter of seconds. Used in large plants and small as auxiliary heat or as the primary source, Reznor Unit Heaters can be suspended or placed on the floor. You are always in tune with the heating season with Reznor Unit Heaters. **REZNOR IS THE OLDEST NAME IN GAS-HEATING EQUIPMENT.**

Our production is limited in accordance with current restrictions, but we are doing everything in our power to ship Reznor Unit Heaters "when promised."

REZNOR

REZNOR MANUFACTURING CO.

602 JAMES ST. • MERCER, PA.

"GAS HEATERS EXCLUSIVELY SINCE 1888"

Figure Profit and Loss Monthly

The monthly profit and loss statement is the only safe passage to adequate costing procedure and even then it supplies adequate information only on overhead expense. A cost accounting system is needed to get adequate information on labor and materials. Neither profit and loss statement nor the financial accounts from which the statement is prepared will supply this data, so you must get such information from a distinctly different recording system by means of material requisition forms, time slips, estimate sheets, etc. These will enable you to keep a careful check on each job, to record actual labor and materials used, and to compile experience figures for future guidance in costing.

Yet many contractors depend entirely on their financial accounts to give them information on costing jobs. That is why their costs are off the beam so often. This is the crux of their costing headaches and is largely the fault of the industry itself. Authorities continually harp on the desirability of costing labor, materials and overhead by means of profit and loss statement ratios. They seldom caution that these ratios may be dangerous to use, that they do not reflect the cost on all jobs, that different types of jobs often have different costs—particularly on labor, which causes overhead expense per job to vary. Profit and loss statement ratios are only average figures and, in any event, the only ratios to use are those on overhead. The time element, probably the most important factor in costing, does not appear on the profit and loss statement. If the contractor is costing overhead on the labor hour basis, even the overhead ratio is of little use to him. He must have some means of deter-

IT SAWS! IT FILES!

A PORTABLE POWER-SAW AND FILE

New

MULTI-PURPOSE TOOL

SAVES TIME — SAVES MONEY

★ The Saw-Chief attaches to electric and air drills, or may be driven by flexible shaft. Hack-saw blade in holder reciprocates rapidly with a 7/8" stroke. Cuts all metals—every gauge, wood, plastics, other materials. Eliminates slow, tiresome hand-sawing operations. Reaches into hard-to-get-at places with ease. Insert ordinary machine file for power-filing operations. It's portable . . . carry it from job to job.

QUICK DELIVERIES ON AA-5 PRIORITY OR BETTER

The Saw-Chief can be shipped quickly, ready for attaching to your drill or flexible shaft at only $45.00. May also be obtained complete with heavy duty drill at $90.00, or with high-powered, lightweight drill at $83.00.

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SAW-CHIEFS are guaranteed to give complete satisfaction. Your money refunded if the SAW-CHIEF does not save hours of labor on countless operations.

Phone your jobber for demonstration today or write us direct!

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mining the time required to do a job in order to cost accurately and this is obtainable only from a costing system kept in addition to the financial records.

Coordinate Accounts to Get Costs

As a matter of fact, although the profit and loss statement may give actual costs, neither the financial accounts nor the cost accounts provide actual job costs in total. Both divisions of accounting must be coordinated to give this information. For example, the contractor can get accurate labor and material costs from his cost records, but overhead even when based on a recent prior period may increase or decrease in the current period so that this element of cost may be more or less than shown on estimates. Nothing can be done to eliminate this completely. However, checking over the financial and cost accounts each month and comparing one set of records with the other will keep such deflections at minimum because they can often be nipped in the bud.

Accounting Shows Overall Picture

The purposes of the profit and loss statement are to provide the overhead figures which are used in costing, to give you a picture of operating movement as a whole, to show trends from period to period, and to enable you to keep a close check on every item of overhead. Overhead as used on the cost records is a lump sum, hence it cannot be supervised properly ex-

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SOLDERING FLUID
(Non-Acid)

Here at last is a soldering fluid that gives outstanding results with all soft solders including lead-rich Victory Solders! It breaks down these solders into an absolute fluid. It is an ideal flux for Zinc-coated Sheet Metal, Tin Plate, Terne Plate, Brass, Copper and Steel. It's economical—a gal. makes 2 to 3 gal. high quality flux. Try it yourself—be convinced of its superiority. Write for literature and FREE sample today!

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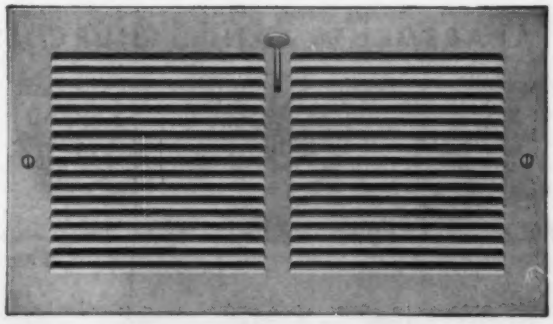
2241 Indiana Ave. Chicago 16, Ill.
SOLDERING TECHNICIANS

An Ever Popular Design the AIRO-FLEX "7000" Series



THIS model is a simple, sturdy, moderate priced register suitable for most forced air heating jobs. Modern and pleasing in appearance, it has single louvre and bendable fins, set when delivered at about 22° downward. Furnished for wall and baseboard registers and intakes. It's an efficient, easily installed register, which does not run up the cost where the job must be kept within limits.

Auer offers a complete line of floor, base, and wall registers and return faces, for gravity or air conditioning systems—including all air directional types. We also make flat metal grilles for all purposes where grille panels are needed.

Ask for Auer Register Book—
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For Air Conditioning *and* Gravity

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BLOWER ASSEMBLIES

INSURE THE FINEST FORCED AIR HEATING PERFORMANCE FOR HOMES, SCHOOLS, STORES, OFFICES, APARTMENTS AND CHURCHES

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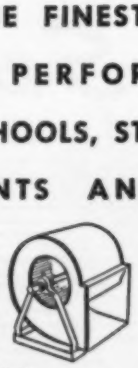

PDUM ASSEMBLY

PDRM UPBLAST ASSEMBLY

Blower Specialists Since 1919

THE Brundage COMPANY

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cept by means of profit and loss statement analysis and comparison with previous records.

In general, you may control the cost of labor and materials by means of cost accounting, overhead by means of financial accounting, and combine this information so that each job is charged with its proper share of what you pay out in labor, materials, and overhead expense on each job.

Fundamentally, the principle of accounting is simple. The financial accounts show what you pay to handle all the business you get, so you must apportion this outgo to each job in accordance with its requirements. This is done by means of cost accounting. The ordinary double-entry financial accounting system that too many contractors use as the sole basis for costing will not suffice. In fact, a perusal of the cost accounting forms shows that the process is largely single-entry, not double-entry. You usually do not debit or credit on cost records as you must always do in financial accounting.

◆

Furnace Selection and Rating

(Continued from page 67)

basementless house as is recommended for a house with a basement.

Perhaps there is one exceptional type of furnace installation that may require special treatment, and that is the case in which the furnace is not located in

WILL WILLIE WILLIAM BILL

4 Little "Fitting" Guys Fighting For You!

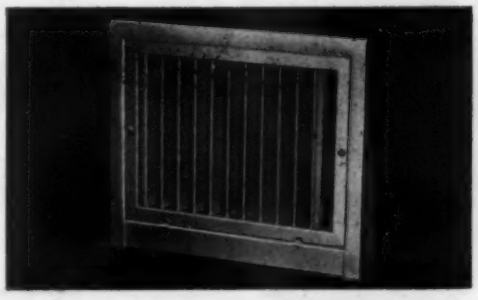
Will cuts installation costs—Willie makes fittings fit—William keeps prices down to bed rock—and Bill sees that there is stock near you.

FLASH NEWS! Complete, simplified line Gravity Pipe and Fittings now available on rated orders.

FREE: Complete, easily understood gravity pipe and fittings catalog showing full simplified line. Write Dept. 2 for prices and catalog.

THE WILLIAMSON HEATER COMPANY
CINCINNATI 2, OHIO

WILLIAMSON
WARM AIR FURNACES



Priced to help you beat competition!

• This popular, two-piece gravity register is priced to help you get the business against the toughest competition. Adjustable vertical multi-louvres direct the air ahead, or in any desired degree to the left (or by inverting the removable face, air may be directed to the right). Convenient lever handle for adjustment. Now, and post-war, you're ahead of the parade with Waterloo "registers of the future."

Waterloo REGISTER CO.
Established 1902

Waterloo, Iowa Seattle, Wash.

the house to be heated, but is placed in an attached heater room. In this case, much of the heat from the casing, smokepipe and bonnet and ducts will not be utilized in heating the main portion of the house. If the separate heater room is located in an attached garage which is not tightly built, the heat transmission efficiency may be low and much of the heat loss from the ducts and casing will not be used in heating the main house. In such cases, the best procedure would be to use an additional pickup or reserve, and to increase the calculated heat losses from the house by a certain percentage, say from 10 to 25 per cent. Installations of this nature are more frequently encountered in the warmer parts of this country; Southern California, for example. It has been observed that considerable heat loss from ducts occurs in installations where the furnace is in a separate attached room and many of the ducts are exposed to the outdoor air. Due to the fact that local practice frequently does not call for the use of adequate duct insulation, the only other recourse is to use relatively oversized capacity units.

Pick-up Reserve Intermittent Heat

One provision in the manual states that:

"For intermittently heated structures, such as churches, an extra pickup capacity is often provided in order to take care of the unusually large heat demand existing at the start of furnace operation, when the room temperatures may be much below normal."

The manual further recommends that:

"Conservative practice for intermittently heated churches or halls provides that the fire be started 24 hours earlier. If this is not possible, an extra pickup

The General Says

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Write today for the complete information which General Blower Co. has prepared for you regarding

GENERAL MULTIBLADE EXHAUSTERS

Ask for Portfolio SC-101—A.A.

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You can "go to town" with AIRMOVERS.

Swartwout's line of modern industrial roof ventilators

Industrialists are paying attention to ventilation of factory buildings as never before. Give them your help in working out their ventilation problems with Swartwout Products—backed by our long experience and the engineering help we give you.

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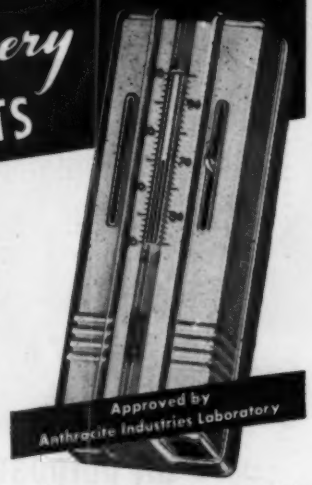
Swartwout VENTILATION SPECIALISTS

Satisfied Customers Approve

***Gleason-Avery* THERMOSTATS**



• Gleason-Avery's accurate, *safe* heating control assures complete customer satisfaction. Finger-tip adjustments and synchronized settings afford easy operation . . . exclusive Straight Line Control means no chain-tangling, no sprockets and rotating arms to get out of order.

Absolutely safe (in case of current failure, the improved G-A Spring Return closes draft, opens check). *Easy to install* (can be mounted in any position. 2-wire low voltage.)

No. 130 Furnace Sentry Unit Package for hand-fired domestic heating systems is complete with thermostat (smartly finished in Mirror-Lite), damper motor and accessories, ready to install.

LIST PRICE . . . $19.50

***Gleason-Avery*, INC.**

AUBURN, N. Y.

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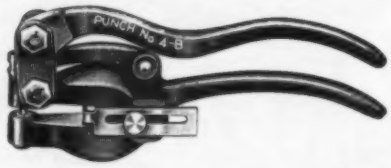
A REAL *Time Saver*



The No. 4B PUNCH
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This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of ¼" through 16 ga., weight 3 pounds, 8½" in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

Alnor VELOMETER

★ all purpose air velocity meter

Instantaneous, direct readings of air speed measured in feet per minute with the *Alnor* Velometer give you the quick, accurate information on air movement needed to check operation of blowers, fans, air conditioning installations, and similar equipment. No calculations, no timing, no conversion tables; read velocities direct from the Velometer scale. Extension jets permit accurate readings in many locations that would be completely inaccessible with other means of measurement.

The Velometer is made in several standard ranges from 20 fpm to 6,000 fpm, and up to 3 inches static or total pressure. Special ranges available as low as 10 fpm and up to 25,000 fpm velocity and 20 inches pressure.

Write for Bulletin No. 2448-E.

Illinois Testing Laboratories, Inc.
419 NORTH LA SALLE STREET • CHICAGO 10, ILLINOIS

or reserve capacity of as much as one-third should be added to normal heat losses."

The question as to whether or not to provide an oversized furnace for a given installation really hinges upon whether or not this matter of pickup firing is clearly explained to the customer. If a janitor for a church building, for example, expects to heat a building that is down to 20 deg. indoor temperature when the outside temperatures are near the design value, the amount of reserve capacity which will be required will depend entirely upon how quickly he expects the building temperature to rise to a normal value. If he allows a 24-hour or 48-hour warming-up period under these drastic conditions, the reserve pickup allowance may only have to be a few per cent. If, however, he expects to heat the building in 6 hours, he may have to have twice the normal capacity. It is good practice to furnish a printed statement that can be tacked up near the furnace, which shows when the furnace should be started for each 10 deg. variation in outdoor temperature. If the matter is carefully explained to the church committee at the time of purchase of the furnace, the heating plants will give excellent results and the furnace will not be abused, as the writer can verify from actual experience.

If, as a result of these discussions with the church committee, some reserve capacity such as 20 per cent is decided upon, it should be understood by the designer that this percentage increase should be *added to each room heat loss* and not merely to the total building Btu loss. In other words, if reserve pickup capacity is required, the ducts, trunks and registers should also be sized to handle the requirements. If the room heat losses are figured without a reserve pickup and the furnace alone is made considerably oversized, the system will operate at much higher temperatures than was anticipated in the design. Once the total building heat loss has been figured, either with or without the pickup reserve, the selection of the furnace is made in the usual manner from Table 4.

To summarize briefly the method of using Table 4, it is recommended that where the installation requires special treatment, as mentioned in the three cases above, the calculated heat losses should be arbitrarily increased. The selection of the furnace should then be made from Table 4. If this policy is adopted, the dealer will not be confused by having to select a furnace having a register delivery either greater or smaller than the calculated heat losses. In other words, any adjustments can be made in the heat loss alone, and one consistent procedure can then be used in selecting the furnace from Table 4.

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Organizing For Post-War

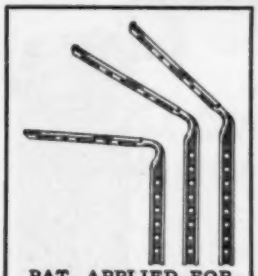
(*Continued from page* 59)

business can function and grow. The owner, if he is to survive, must throw away his overalls and lead a sales forces himself (or through a sales manager) in addition to managing his business. A day spent hiring a man who will sell fifty or more heating plants a year will pay bigger dividends than puttering around on snip work.

In organizing for post-war we must locate our place of business in a trading center of the town (where a great number of people pass each day) because in addition to displaying the latest in heating we are going to need a large, clean display room to show stoves, ranges, heaters, insulation, refrigerators, water heaters, regulators, room coolers, attic fans and deep freeze units. Dusty display rooms on back streets showing smoke pipe and sheet metal will not serve to make people dissatisfied with what they have. Automatic heating must be demonstrated in display rooms and in homes; and most of these presentations must be made at night time when the whole family can be shown what modern heating and air conditioning can do for them.

Back of the display room and office, we should locate the warehouse and shop. Maybe the shop and warehouse will have to be located separately from the office for lower overhead. The warehouse and shop should have the latest labor-saving devices, such as an electric hoist on a monorail, lift truck self-propelled, etc. Much can be said for contracting all trucking to a

IMPROVED!



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33⅓% STRONGER

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SET No. 1—1" to 20" in 2-3-4-5-6-7 piece, including T PATTERNS 2" to 20"—152 Patterns $2.50
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SETS No. 1 and No. 2 postpaid $5.00
45 Degree BRANCH PATTERNS IN TWO SETS
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Write for pattern circular giving full information. Mention American Artisan.

MOVE 30% MORE AIR
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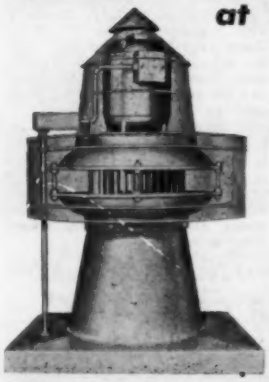

Here's a new idea that revolutionizes ventilating . . . the Air-Van Power Exhauster moves 30% more air at less power cost!
Accepted everywhere for its phenomenal performance, superior design and splendid construction, the Air-Van Power Exhauster is your answer to all ventilating problems! Write for complete details today.

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Gas Pressure REGULATORS
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Certified by A. G. A. Testing Laboratory. Write for Catalog and prices on Barber Conversion Burners, Appliance Burners, and Regulators.

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Roll Forming Machines and Roller Dies

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These days, when all furnace men have more work than they can handle, it's just good business to use Fireline. No long waits for firepot castings when you use Fireline. It repairs any furnace job, big or small. Seals all cracks and holes . . . Salvages burned-out firepots . . . Protects and preserves good castings with its durable, heat-saving refractory lining. Quickly installed. Job-for-job, your profit is greater with Fireline. Write for bulletins, prices, and name of nearest jobber.

Also ask about IRONSET Furnace Cement

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury Street, Chicago 14, Illinois

drayage concern and having salesmen, installers and service men transport themselves in their own automobiles. The latest equipment and tools in the shop and in the hands of outside mechanics should be looked into now. Out of present profits, arrangements should be made for the purchase of latest tools and equipment.

Needless to say, in organizing for post-war business our policy must be "Every customer must be satisfied," in order to build a permanent, growing business. *Sales must come first,* but to satisfy customers and maintain this growing business, we must sell top quality merchandise. It must be well-engineered and installed and adjusted correctly; service must be prompt and efficient. Good collections will follow. Space will not permit all factors to be discussed in this article on "Organizing for Post-War Business," but if it serves to stimulate our thinking, it will have served its purpose.

◆

Kruckman—
After V-E What?

(*Continued from page* 53)

production was a sound reason for not producing the equipment needed by the dependent service industry. Thus, there has been built up a backlog of potential orders for the machinery after the war that will run somewhere around $75 million to $100 million.

The rehabilitation would have been a fine stopgap for a number of small plants; and it would have been

Std. Arr. No. 1 for Belt Drive

New and improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

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The **Majestic** Co., 990 Erie St., Huntington, Indiana

a splendid opportunity for Maury Maverick to show what his Smaller War Plants Corporation might do with its $200 million. When you run into first-hand examples like this one you wonder about that protective fervor for smaller business. There is the old saw that the Lord helps those who help themselves. When smaller business gets so organized that it can help itself, like labor and farmer, then the fervor will be "implemented" in the popular argot of Washington.

The general thought here seems to be that there will not be a sag after the three-month lag that will follow V-E Day. It is expected the switch-over to civilian production will be gradual, regular, healthy, and unremittingly expansive. The four years' backlog in all consumer, industrial, and primary fields is so great, and the demand from abroad is so vast, that it is assumed here we will have another stupendous boom for at least eight to ten years after the war finally is over.

They tell us to bear in mind that productive facilities in Europe have collapsed, been blotted out, except what may be revived for local needs. Europe is not expected to come back for generations, or centuries. The thousand year old domination of the continent of Europe by the British presumably will pass to the Russians. We have frequently been told here by some of our British friends that they have begun to see some of realistic beauties of the Soviet system. Obviously there are relatively only minor modern production facilities outside of the United States to serve the needs of the modern world. South America, from all reports, will absorb tremendous quantities of the things we can supply. Undoubtedly vast wealth will flow into South America from those parts of the world

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MONMOUTH HUMIDIFIERS
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Formerly made by Monmouth Products Co.
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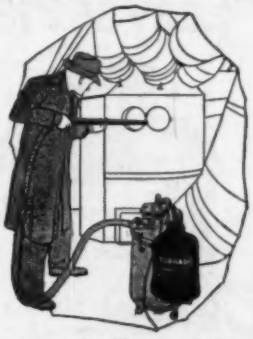
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CONSIDER the post-war angle of TORNADO FURNACE CLEANERS—as an independent, profitable business—and as a means of getting more business. A small investment—big profits—work at your leisure. Why wait? Delays are often expensive! Get details.
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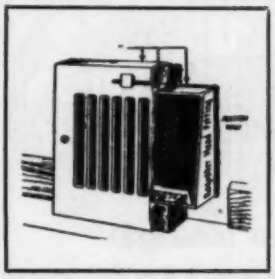
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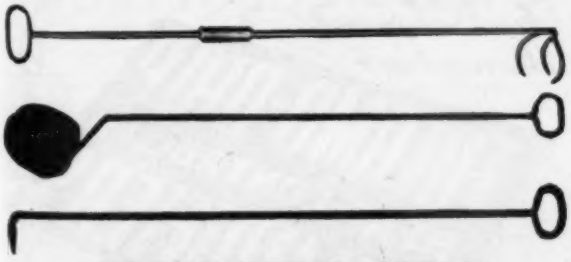
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BEST BY FORTY-TWO YEARS TEST

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Bremil Two Sizes

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ALL-ALLOY No. 2 cuts up to ⅛" steel plate.
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BREMIL MFG. CO., ERIE, PA.

whose economy and society has been ruined. This new population, with the collective means it has been able to salvage, will buy American. Total these needs, and give a thought to the future needs across the Pacific, and you may readily understand why these people here think the eight or ten years after the end of the war will see a boom such as we have never even imagined in our wildest moments.

Manpower Bill is "Dead"

No one worries about manpower here, now. The manpower bill is absolutely dead so far as a labor draft is concerned. Nor will there be any job freezes with drastic penalties. Byrnes killed it. What he said about postwar unemployment routed the White House, the Army, and the Navy. Present WMC controls will continue indefinitely, and they will undoubtedly be milder. When you think about manpower, as well as other problems ahead, also think about the fact that 14 million men and women will come back into civil life from the armed forces after the war. These 14 million each may be regarded as representing a family of 3½ persons. The total adds up to approximately 50 million people. Discount the junior members, and you still have approximately 30 to 35 million adult persons with votes.

This reporter can remember the enormous political power the Grand Army of the Republic exerted back in the late 1880s and the earlier 1890s. Their number was modest compared to this group. But relatively they held a comparable strength to the population of the country of those years. After this war the veterans will run the country. They will get the jobs. They can make it their country.

AT IT SINCE '93

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The Name That Means

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For Balanced Atmosphere

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HEAT-CONTROLLED

HUMIDIFIERS

AUTOMATIC HUMIDIFIER CO. Cedar Falls, Iowa

The total of employed workers in the opening years of the postwar era is roughly estimated at 55 million, or 5 million short of Henry Wallace's 60 million, or 2 million short of the number regarded as minimum by the economists here. Going back to prewar work-hours it is estimated there will be 13 million employed in factories; transportation and utilities, 3,300,000; government, 5 million; mining, 1,100,000; construction, 2,200,000; agriculture, 8,500,000; trade, 8,500,000; service, finance, miscellaneous, 4,800,000; casuals, domestic, and self-employed, 5,800,000. It is estimated there will be over 6 million unemployed after the war IF the Government does not launch a considerable work-program. It is quite certain, however, that there will be such program. Roads, Federal works, rivers, harbors, flood control, and several other projects already authorized, totalling roughly $15,000,000,000, constitute many work-years for thousands of men. In addition it is very likely at least fifteen river basins will be transformed into regional authorities similar to the TVA with huge expenditures for all kinds of improvements, largely for electrical power. The more solid projects for development after the war, involving vast expenditures of private capital, are many, and constitute a picture in detail that sounds like a magnificent dream. But that is another story.

This letter started out with a comment about the certainty in many business minds about the removal of Government controls when the war is over. Unhappily it sounds like a wishful dream to us here who watch the trend, and who are familiar with the

PRECISION PROCESSED DOUBLE ADJUSTABLE GRILLES

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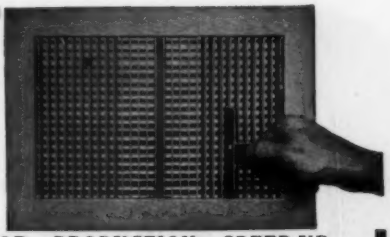

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Interlocking Combustion Chambers . . . Baffles
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• We are building a limited number of Red Streak Furnace Cleaners under Federal authority, to be sold to buyers who can qualify, which should not be difficult. Write for complete information on purchase procedure. Pre-war price, pre-war quality. First come—first served. All repair and maintenance parts and materials are freely available to all.

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REPAIR PARTS FOR ANY FURNACE, BOILER OR STOVE

Complete Line of Sundries and Supplies

FOR QUICK SHIPMENT

OMAHA STOVE REPAIR WORKS
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SINCE 1882

MOREY FLOAT VALVE
DESIGNED FOR EVAPORATIVE COOLERS
HAS MANY OTHER USES

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SIMPLE IN OPERATION
EASY TO CLEAN

Materials corrosive resistant. IRIDITE PLATED. Non Water Absorbing POLYSTERENE FLOAT. Will flow 70 G.P.M. at 20-lb. Pressure. Usual Trade Discounts.

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TELEPHONE CRESTVIEW 5-3351
ALSO MANUFACTURER of MOREY'S PRECISION
Evaporative Cooler (Mats) Pads—Send for Price List

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VERNOIS furnaces give such wonderful satisfaction because they are carefully engineered and built of the finest materials available. When a Vernois furnace needs a new part, use only genuine Vernois parts for continued fine performance. Buy them direct.

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the "Stronghearted"
STOKER
ECON-O-COL Automatic COAL BURNER
ECON-O-COL STOKER DIVISION
COTTA TRANSMISSION CORP.
ROCKFORD ILLINOIS
THE SHIELD OF QUALITY

NIAGARA
GRAVITY AND FORCED AIR
FURNACES
DURABLE • EFFICIENT • DEPENDABLE • ATTRACTIVE
THE FOREST CITY FOUNDRIES CO.
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WATCH FOR Gilco's announcement of their new improved line of Automatic Water Heaters and Furnaces
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Automatic
FURNACES and WATER HEATERS
J. L. GILLEN & Co.
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GILCO

Leader
KOOLSTACK FURNACES
FOR STOKERS
OIL or HANDFIRED
50,000 to 200,000 BTU's
Patented Damper Uses All the Heat in the Added Heating Surface
THAT IS SOMETHING TO SELL
LEADER IRON WORKS, Inc.
Decatur Illinois

☆ WAR TIME

Elgo Shutter & Manufacturing Company, 6970 W. Jefferson, Detroit 17, with 25 employees at the beginning of the war has lost 16 to the armed forces—5 in the Navy, 3 in the Marines, and 8 in the Army.

Leslie Burdett (U.S.S. "Essex")
D. J. Gendron (Ship unknown)
A. J. Cloutier (Ship unknown)
R. W. Bales (Ship unknown)
C. Snider (Ship unknown)
Dale Spitler (paratrooper, Pacific)
J. W. Blastow (Pacific)
R. A. Rosalik (killed in action, Solomon Islands, Oct., 1942 —paratrooper)
J. L. Miller (Artillery, Pacific)
C. E. Ayers (Italy)
W. DuPont (Italy)
E. D. Papas (China)
W. J. Dypka (Air Force, Nebraska)
H. F. Kay (France)
T. H. Gendron (Infantry, Philippines)
A. N. Varadi (Infantry)

T. H. Gendron has been awarded the Silver Star, in action on Leyte last October. His citation says: "Private Gendron, a member of a rifle platoon, advancing under heavy machine gun and sniper fire, with complete disregard for his own safety, crawled into the lane of fire to carry a wounded soldier to cover."

The company has sub-contracts for "Quonset Hut" accessories—shutters and dampers—in one and two thousand unit lots; and other orders carrying high priority—destination unknown. All orders are for army, navy, aircraft and ordnance—CMP allocation, 95 per cent AA-1 and 5 per cent AA-2X.

George A. Soules was promoted from shop superintendent to sales manager last August, and LeRoy F. Bullock, shop foreman, was promoted to shop superintendent, but the Marine Corps have had their eye on him through four deferments.

The company carries a War Bond savings account that has been regularly subscribed to since 1942.

Seventy-five per cent of the names listed have seen action in Italy, The Solomons, Philippines, France, North Africa and at sea. Eighty per cent of the men listed were employees of long standing, their period of employment being from 3 to 7 years.

Readjustments since the start of the war have been made and the present set-up for key positions is as follows:

John Spargo, general manager (co-partner)
Emil A. Mader, chief engineer (co-partner)
George A. Soules, sales manager
LeRoy F. Bullock, shop superintendent
Miss C. Engel, office manager
Chris Spargo, chief draftsman
George W. Soules, shop foreman

◆

Goese Manufacturing Company, Milwaukee 6, Wisconsin, is engaged to full capacity on sub-contracts for bomber parts. —Arthur A. Goese.

MERCOID SENSATHERM
A thermostat of unusual construction and unfailing performance. Requires no artificial acceleration
THE MERCOID CORPORATION 4201 BELMONT AVENUE CHICAGO 41

TRADE NEWS ☆

Goulds Pumps, Inc., 240 Falls St., Seneca Falls, N. Y., flies the Army-Navy "E" and their service flag shows 158 in the armed forces, three of whom have been killed in action. The slogan reads "They Fight for Us—We Work to Bring Them Home Victorious."

Goulds is distributing an 8½x11 inch, spirally bound booklet—34 pages with covers—showing Goulds pumps at war. Official pictures show LST, LCI, cruisers, airplane carriers, submarines, sub chasers, rescue vessels, net tenders, barges, cargo vessels, tugs, coast guard cutters, tankers, life boats, "ducks," each accompanied by pictures and descriptions of the type of pump used thereon. Flame-throwers and mobile laundry trailers also need pumps to handle their fuel and water. Portable pipe lines, refineries, synthetic rubber plants, aluminum plants, ordnance plants and engine builders all require pumps. The Goulds plant has a half-million square feet of floor space devoted to the manufacture of pumps.—**G. W. Cramer, Adv. Mgr.**

◆

A priority has been given to **The Herman Nelson Corporation**, manufacturer of heating and ventilating equipment, by the War Production Board for the erection of a 51,000 square foot addition to one of its plants in Moline, Ill. Other plants are located in East Moline and Chicago, Illinois. According to R. H. Nelson, president, this additional factory space is required because of large contracts recently awarded Herman Nelson for the manufacture of self-powered heaters.

These heaters have been extensively used during the war by the Army Air Forces, Quartermaster Corps and the Navy for the preheating of airplanes, tank and truck engines in cold climates and for the heating of all types of portable tents, Quonset huts and structures used by combat troops.

◆

Wales-Strippit Corporation, 345 Payne Avenue, North Tonawanda, N. Y., and the men and women of this corporation, have won the Army-Navy Production Award for the second time, for meritorious services on the production front. The White Star, which the renewal adds to their Army-Navy Production Award flag is the symbol of appreciation from the Armed Forces for continued and determined effort and patriotism. This renewal of the Award permits the "E" flag to have a White Star in its blue field.

◆

Capt. Carl R. Embury, Air Corps Ordnance, formerly an engineer in the Chicago office of the **Freeman Stoker Division, Illinois Iron & Bolt Company**, has returned to the U. S., by air from China after a serious injury and is now recovering at Gardiner General Hospital in Chicago. Capt. Embury received a fractured femur while attached to the 14th Air Force in China. On his trip to China, the transport was sunk by an aerial torpedo and he was wounded, but managed to assist in evacuating casualties from the ship.

PLANING MILL EXHAUSTERS

DIAGRAM shows how special streamlined inlet deflects air stream so as to reduce turbulence and back plate erosion.

RESULT: higher overall efficiency, lower maintenance cost, less time out for service and repairs.

SEND FOR DETAILS *including performance and dimensions in Catalog 410.*

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Compound Action
AVIATION SNIPS

Used extensively by leading aviation and metal working industries and in U. S. Government Plants throughout the country.

- Cuts circles, squares and irregular patterns on Stainless, Dural, and Monel Metals with ease.
- All Parts interchangeable.
- M1 for cutting left—M2 for cutting right.

WISS BULLDOG AND STANDARD PATTERN SNIPS are used in Shipyards, on Government construction projects, and on maintenance work wherever sheet metal is required.

Send for literature of complete line

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ESTABLISHED 1848 NEWARK 7, N. J.

Remember COLE HOT BLAST *Gas-Fired FLOOR FURNACES*

Will again be on the market after it's over, but now it's war work.

COLE HOT BLAST MFG. CORP.
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...ous Patented *Monogram* Vaporizing Burner
...ovides Highest Known Operating Efficiency with Oil

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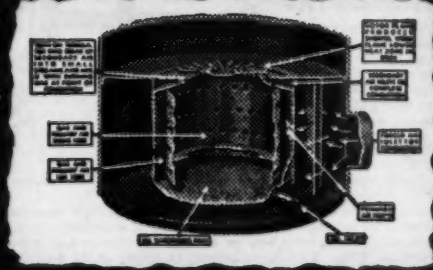

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Automatic Water Heaters

...e QUINCY STOVE MFG. COMPANY, Quincy, Illinois

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Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — Precision — accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for .3/16 inch mild steel and 10 gauge stainless.

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ASBESTOS PRODUCTS

Quality Asbestos Products for all types of insulation. Asbestos Papers, Millboards, Aircell Papers and Pipe Joint Tape. Pipe Covering for all kinds of steam, hot and cold water lines.
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- ✓ Satisfied, loyal customers
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H-1A

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GENERAL OFFICES: MILWAUKEE, WISCONSIN

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WHOLESALE DISTRIBUTORS
SHEET METAL
FURNACES
AIR CONDITIONING SUPPLIES

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Are You Looking For An
AGGRESSIVE DISTRIBUTOR?

We are a well-established, financially sound firm distributing a number of nationally known lines in Northeastern Ohio. We are interested in establishing new lines . . . for after the war . . . NOW. Write for more information.

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HELP *S-t-r-e-t-c-h* FUEL!

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This highly efficient, low cost barometric draft control will bring you easy, BIG-VOLUME sales. *Closer control—provable 10% to 25% fuel savings.* Equipped with new, simplified outside draft adjustment. With universal sleeve, fits all standard domestic pipe sizes 7" through 12".

Write or wire for full information.

Draft KoreKtor
Type F, 909

Cole-Sullivan Engineering Company
1316 No. Third Street Minneapolis 11, Minn.

thought and judgment of the men who are running the Government. Most of them, like you, have a horror of permanent controls. And most of them hope, but do not know how their hope may be realized, that the controls will be removed, say, 10 or 15 years after the war. But scarcely any of them have any hope that the controls will be removed immediately after the war. It is generally accepted as inevitable and unavoidable that controls will remain for some years. There will be price controls, controls over materials, over distribution, over labor relations, virtually all the controls we have today—and probably then some more.

The world will be in flux and uncertainty and conditions will be more or less chaotic. There are stupendous backlogs of demand in practically all industries. There are less raw materials than will be needed here and elsewhere. Some metals, crude rubber, textiles, chemicals, lumber, paper and pulp, leather, containers, are known to require controls for years. There will not only be national controls, but it will be necessary to continue the umpires of distribution we have known as the combined boards. When you discuss the bewildering picture with business people you find those who deal with primary phases, with raw materials, want the controls. The fabricators, manufacturers, wholesalers, do not realize the need for controls, and hopefully and wishfully proclaim there will be no controls. The retailers apparently have not worried about it very much, and seem to assume the controls may stay. They will. The good people who tell each other there will no longer be reason to worry about the people in Washington after V-E Day are in for an awful shock.

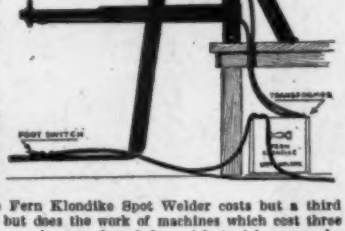
IMMEDIATE DELIVERY
FROM STOCK!

CONDUCTOR PIPES, TOOI

ELBOWS & SMOKE PIPE

KRAUSER-BOYD, INC.
553 RIVER ROAD • N. TONAWANDA, N. Y.

FERN
Klondike Spot Welder
Model 22SW Bench Type



Operates on any ordinary 30 or 60 amp. electric service. Spot welds 20 gauge or lighter metal, cold-rolled steel, hot-rolled steel (Clean, Pickled), Stainless Steel, Nickel Plated Steel, Nickel Alloys, Monel Metal, Silicon Bronze Type Alloys, Pure Zinc and Nickel Silver, Unpickled Hot-Rolled Steel, Aluminum and its Alloys, Tin Plate, Terne Plate, Chrome Plate, Galvanized Iron and other coated materials. The Fern Klondike Spot Welder costs but a third of other spot welding equipment but does the work of machines which cost three times as much. This equipment can be transferred from job to job or can be used on a bench in shop. Can be purchased in an 18 or 20 inch throat, very simple to operate.

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A Dandy 10-Piece Set: Rigid Pipewrench, Channellock Pliers, Adjustable Wrench, CEE-TEE Pliers, Diagonal Cutters, Ballpein Hammer, Plastic Screwdriver, Waterpump Pliers, Hacksaw & Blade, Cold Chisel—$19.85. Remit with order TODAY.
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Sheet Metal Workers.
Furnace Installers.
Full Time—Year Round Work.
Modern Shop—Paid Vacation.
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WANTED: Sheet metal workers in job shop. Excellent post-war possibilities. Steady employment to competent workers. P. O. Box 84, St. Petersburg 1, Fla.

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WANTED SHEET METAL BUSINESS

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SHEARS, ROTARY; No. 6 QUICKWORK 1" cap. 48" thrt.; CIRCLE, QUICKWORK, 20" thrt., 5/32" cap.
SPOT WELDERS: 250 KW FEDERAL PRESS TYPE; 25 KVA THOMSON; 20 KVA GIBB PRESS TYPE; 10 KVA TAYLOR-WINFIELD.
NEW REX WELDERS, 150, 100, 75, 50, 40, 30, 20, and 10 KVA in Stock.

These are but a few of the machines available in our large and diversified stock. Let us help you with your engineering problems—We solicit your inquiries for machines to do your war and post-war work.

INTERSTATE Machinery Co., Inc.
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Pentco Improved Compound Action Aviation Snips

U. S. Government approved

For Cutting All Kinds of Metals

A Real Precision Tool!
Maximum Power—Minimum Effort
Right and Left Cut

Blades made from alloy steel hardened and tempered for rough use. Will cut with ease all grades of steel. Side locking feature that will not interfere with cutting blades. Case hardened bolts. Made in four different types. Write for catalog S.

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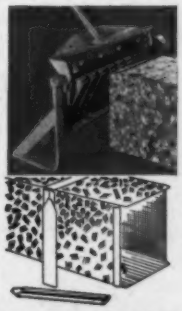
THE COMPLETE DRIVE CLEATING MACHINE
SAVES MORE TIME per joint of pipe, over ordinary hand methods, than any other machine used on square pipe work . . . and it is USABLE MORE OFTEN per job, because it edges the pipe and makes drive cleats to join them together.



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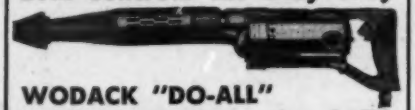
Takes All Sizes Up to 12"
NO. 18
Takes All Sizes Up to 18"
Write for More Information.

R. E. SMITH 1513 MONROE, WAUKEGAN, ILL.

Drill Concrete *the Easy Way*



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4627 W. Huron St. Chicago 44, Ill.
Telephone AUstin 9866

Better for Every Spraying Purpose

MARLEY SPRAY NOZZLES

"Tops" for Air Washing, Humidifying, Brine Spray Lofts, etc. Marley nozzles lead all in sales and in profits to you.

*Finer, more uniform spray. *Effective operation at Low Pressures. *No internal parts to clog or wear.

MARLEY CO., INC. Write for Literature Now! Kansas City, Kansas

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YAGER'S Soldering Salts — Past Reg.

Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.
½ lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.
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DOYLE VACUUM CLEANER CO.
227 Stevens St., S.W.
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